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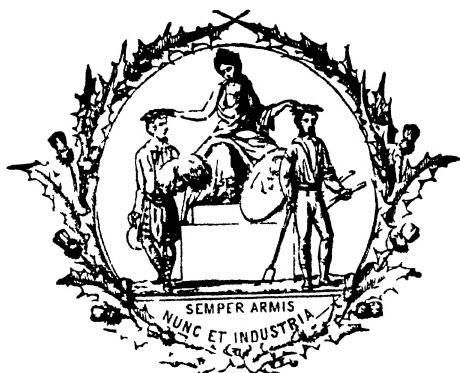
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TRANSACTIONS
OF
THE HIGHLAND AND AGRICULTURAL
SOCIETY OF SCOTLAND

WITH
AN ABSTRACT OF THE PROCEEDINGS AT BOARD AND GENERAL
MEETINGS, AND THE PREMIUMS OFFERED BY
THE SOCIETY IN 1925

PUBLISHED ANNUALLY



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TRANSACTIONS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

SHEEP SCAB.

By SIR STEWART STOCKMAN, M.R.C.V.S., Ministry of Agriculture
and Fisheries.

SHEEP SCAB is not a disease in the strict sense. It is a condition of the skin due to infestation by certain parasites, which, while living and breeding on the skin, puncture it to obtain their nourishment from the lymph and blood. Nevertheless, sheep infested with the parasites of Scab may become very unthrifty, emaciated, and cachectic from constant irritation and sapping of vital fluids. They may even perish if neglected.

In man the condition is known as Scabies, and in animals other than sheep as Mange and Acariasis. There is evidence that the condition in man and animals was known to Moses. The presence of mites was known to the Arabs in A.D. 1174, but it is doubtful if their doctors regarded them as the causative factor of the disease.

SYMPTOMS.

The parasites of Sheep Scab do not burrow beneath the skin, but, while living on the surface, puncture it to obtain nourishment, and thereby cause intense itching and the formation of multiple scabs. The affected animals rub themselves against fixed objects, nibble at the itchy parts, and the wool becomes broken and detached. Tufts of wool may be found on the pastures and sticking to the fixed posts,

rails, bushes, and rocks, and other sheep may pick up the parasites by using the same rubbing places. A scabby sheep shows signs of great gratification if caught and gently scratched with the fingers. It moves its body and works its lips in a gratified manner, and pushes towards the operator. The writer has had two experimental cases in which by continuing and increasing the scratching for a few minutes the animals could be thrown into an orgasm, during which they fell on the ground and lost consciousness. In old chronic cases the sheep lose much condition, and the skin becomes bare and



Fig 1 --*Psoroptes communis* (var *ovis*)
Adult male.

× 70

hard. Death may even occur in neglected cases from emaciation and weakness.

THE PARASITE.

The parasite is a mite. It belongs to the class *Arachnida*; Order *acari*; Sub-order *Sarcoptoidea*; Family *Sarcoptidae*. The genus which causes Scab in sheep is the psoroptes—*Psoroptes communis* (*ovis*). It is commonly spoken of as the acarus of Sheep Scab. The life-cycle of the acarus has long been known, but it seems necessary to recount it in an article of this kind, as it must be repeatedly referred to for a proper understanding of the epizootiology of the disease and the

measures directed towards its cure and prevention. To know the life-cycle, however, does not itself complete our knowledge of the parasite; an acquaintance with its habits is also of the first importance to the epizootiologist. Definite information on the latter subject, such as carries us beyond mere speculation, has been acquired at a much later date than that concerning the life-cycle; it has served to remove some widespread popular fallacies which seemed extraordinary, such as the long period the acari were credited with being

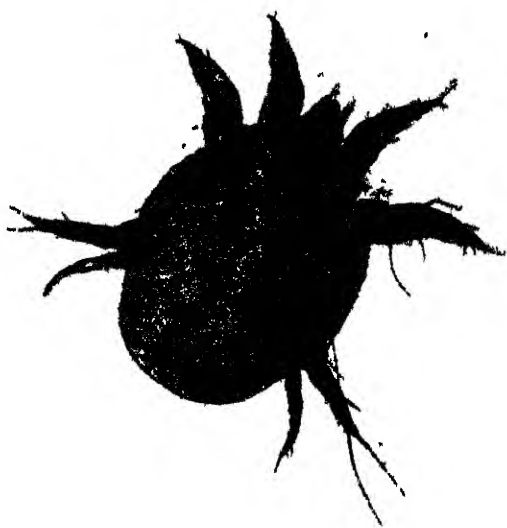


Fig 2 — *Psoroptes communis* (var. *ovis*)
Adult female

able to live away from their food supply, the bodies of suitable species of animals.

The acarus or mite of Sheep Scab in its adult form measures from 1/40th to 1/50th of an inch in length, the male being smaller than the female (Figs. 1 and 2). They can just be seen with the naked eye. The adults have four pairs of legs. These end in sucker-like discs borne in this genus on a peduncle of three segments. The suckers are absent from the fourth pair of legs in the male; they are absent from the third pair in the adult female, which carry long terminal hairs. The

male has two copulatory suckers at its posterior end, which during the act of pairing enable it to attach itself firmly to two projecting knobs at the posterior end of the female.

The females lay eggs measuring about $1/125$ th of an inch, and die when the laying is completed. According to a now ancient calculation by Gerlach, each female lays about 15 eggs. Others have claimed to confirm this calculation, but it is more than questionable, in many cases, having regard to the methods stated to have been followed, whether the alleged confirma-

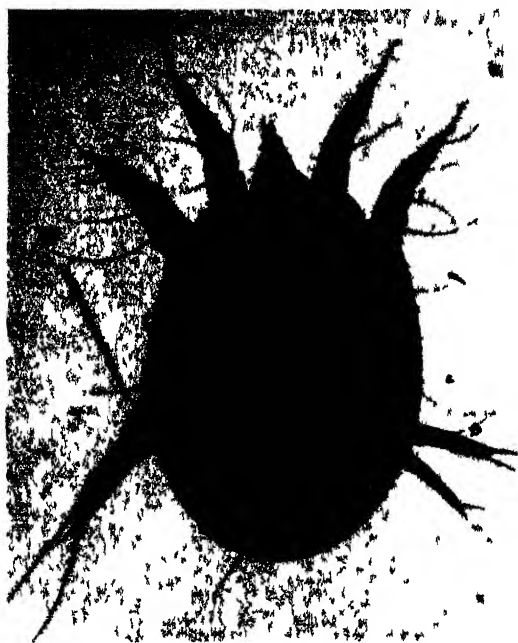


Fig. 3 — *Psoroptes communis* (var. *ovis*)
Adult female Containing egg

× 80

tions had any justification in fact. Statements have been made that by removing newly-fertilised females from the skin of a sheep, and keeping them at an incubating temperature, they have been found to lay 15 eggs. In trying to repeat these alleged observations in collaboration with Mr Berry at the Ministry's laboratory in 1913, the writer found that such females, so treated, laid 1 egg (Fig. 3), and very exceptionally 2 or 3—never more,—and that only a few of them lived under these conditions for 15 days.

For a more accurate study of the egg-laying habit, a pill-box, the lid and the bottom replaced by special screening silk

of very fine mesh, was fixed closely against the skin on a clipped area of a sheep's body. Single newly-fertilised females were put into these cages, in which they were able to feed through the fine meshes of the silk. The silk was searched each morning with a magnifying-glass for eggs. If none was found, the female, presumed to have fed, was removed to a watch-glass with another superimposed, placed in an incubator (25° to 30° C.), and the laying awaited, which generally took place a few hours after removal. By following this method of observation (that is, by allowing regular feeding), it was found that most of the females laid 1 egg in 24 hours, though in exceptional cases there might be 2. Some of them laid fewer than 15 eggs, whilst others laid more. It was not found possible by these somewhat artificial manipulations to fix a minimum or a maximum to the number of eggs laid, but it was concluded from all the observations that Gerlach's calculation of 15 eggs per female represented a fair average. Attempts were made to conduct the observations under rather more natural conditions, by leaving the female in the cage undisturbed. It was found, however, as was not unexpected, that long before the egg-laying was completed the first eggs had hatched, and the larvæ had moulted to other stages. Sometimes, in fact, by the twelfth day, while the original female was still laying eggs, some of the first-hatched larvæ had reached the adult stage, and were contributing a further supply of eggs to confuse the observation, but the egg yield per female was far in excess of 15. At the end of the laying the females shrivelled up and died, and this often happened before 15 eggs had been laid. Some females could not be got to lay at all during the period of observation.

Following this method of observation later in South Africa, Shilston calculated that a female could lay as many as 5 eggs per day, and a total of approximately 90, and his observations do not seem open to serious question.

The fact of the female laying more than 1 egg at a sitting is borne out by Fig. 4. That is, however, an unusual specimen, which on that account was photographed when found by the writer.

It will be obvious from the above, whether each female lays 10 or 20 eggs, or more, most of which give rise in about 12 days to other adult females, which again reproduce themselves at the same rate, that an enormous crop of parasites, amounting to millions, may be produced in a comparatively short time if circumstances are favourable. Circumstances, however, as indicated above, are not always favourable, some females laying at once, whilst others do not. Shilston found the same thing to occur in South Africa, and attributed it, not without reason, to an excess of oily substance on the skin, and an absence of moisture in the atmosphere. In the view of the writer, delayed laying or breeding must be accepted

as an observed fact. Moreover, its existence accords with other observations by the writer in the field (to be afterwards referred to), which it may partly explain—viz., the seasonal prevalence of Scab in visible form, and the long delays which not infrequently take place between contact with infection and the appearance of objective symptoms. Whether delayed breeding and progression are due to the above suggested causes, or to something inherent in the physiology or biology of the parasite, must be taken as a question unresolved, but it has to be reckoned with.

The eggs (Fig. 5) are hatched outside the body of the acarus,



Fig. 4.—*Psoroptes communis* (var. *ovis*).
Adult female. Containing 3 eggs

x 60

but somewhat rare exceptions to this have been observed by the writer in which an apparently fully-formed larva could be seen inside the female (Fig. 6). The average time between laying and hatching was found to be 4 days at incubating temperature. None of the eggs which had not hatched out by the eighth day produced larvæ. In the climate of South Africa, Shilston arrived at similar results. He found, however, that most of the eggs had hatched out in 2 days, and in one case there was hatching after 9 days, but never later.

The larvæ (Fig. 5) have 6 legs (hexapod). After being hatched they feed, and moult to nymphæ; time occupied, 2 to 3 days.

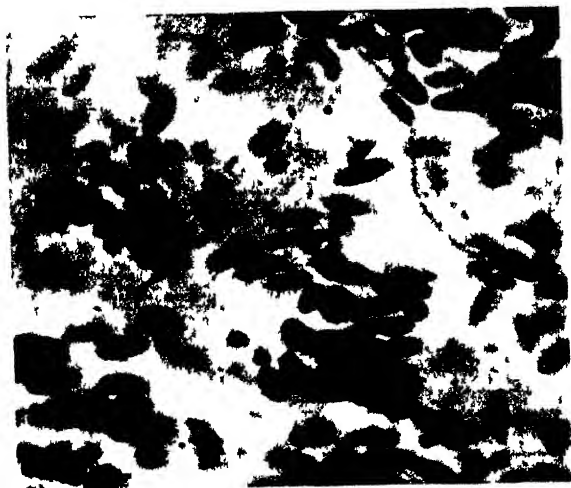


Fig 5 — *Psoroptes communis* (var *ovis*)
Eggs and larva

30



Fig 6 *Psoroptes communis* (var *ovis*)
Adult female containing mature larva unborn

× 70

The nymphæ (Fig. 7) have 8 legs. They have suckers on the 1st, 2nd, and 4th pair of legs, but have no mating tubercles at the posterior part of the body. The nymphæ moult to the stage of pubescent female or male; time occupied, 3 to 4 days.

The pubescent female possesses mating tubercles.

The male has suckers on the 1st, 2nd, and 3rd pair of legs, and possesses mating suckers at the posterior part of the body.

After mating, the females moult to the stage of ovigerous females; time occupied, about 2 days.

The ovigerous female (fully adult) has suckers on the 1st, 2nd, and 4th pair of legs, and has lost its mating tubercles, for which there is no more use.

The time occupied by the life-cycle under ordinary circum-

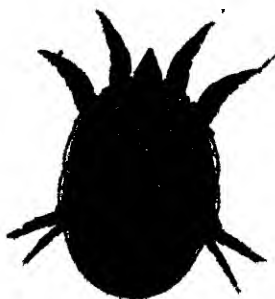


Fig. 7.—*Psoroptes communis* (var. *ovis*)
Nymph.

• 100.

stances is about 10 days, with slight variations either way, but, as previously mentioned, delayed breeding and progression must be reckoned with in practice. The basic period of the cycle, however, is of practical importance, which will be referred to under measures for control and eradication, but as the vital consideration in this connection is not egg to fully adult female, but egg to egg, another 2 days may safely be added to the cycle when designing the interval, say, between dippings having for their object the prevention of egg-laying.

DURATION OF INFECTIVITY.

The writer has shown by experiment and prolonged observation that sheep badly infected with Scab may recover without

treatment, and even cease to be infective, but it is not suggested for a moment that this is anything but exceptional, and it is correct that on hill sheep walks there are found animals (usually rams) chronically affected with Scab. Such sheep can be picked out, though they are often too wild to catch easily. They have suffered from an attack which has extended over the whole body, and rendered most of the skin unsuitable for the feeding and breeding of the acarus, though some of the latter have been able to find islands or patches (usually at the base of the tail) where they can still carry on. These are obviously dangerous animals. The Ministry's inspectors have not infrequently come across them in sheep drives for purposes of statutory dipping, and in some cases they have been found dead in hollows, their throat having been just recently cut by the shepherds to avoid having to present them at the supervised dipping-tank. This is perhaps the best thing that could happen to them, but unfortunately they are sometimes left alive on the hill, as they are not intimately of the flock, and do not follow it.

It is not, however, with this form of duration of infectivity that this section is mainly concerned, but rather with the duration of infectivity in the case of material containing the parasites after removal from the sheep.

In the case of eggs, the subject has already been dealt with under period of hatching. It may be accepted that eggs which do not hatch out in 9 days will never hatch. As regards the other stages of the parasite, the following Table gives shortly the results of the writer's observations in 1910.

Fifty-six samples of heavily-infected wool were used. These were kept in an ordinary room, and were examined at different periods by gently heating and looking for movement on the part of the parasites, by incubating, and by testing infectivity on sheep.

TABLE I.

Periods in days	Between	10-15	15-20	20-25	25-30	30-35	35-40	40-45
Number of ob- servations		2	8	17	10	7	5	7
Positive . .		2	5	10	6	2*	0	0
Negative . .		0	3	7	4	5	5	7

* None above 31 days.

In the samples kept over 15 days the majority of the acari were dead, and those which showed movement were very feeble and in a dying condition; only the older forms survived; no ova hatched out.

Ten attempts were made to infect sheep with heavily-infected material which had been kept for a month. All failed.

These experiments were supplemented by others, in which sheep were exposed in pens which had been vacated for different periods by sheep badly affected with Scab.

Positive results were obtained in pens which had been left vacant up to 8 days, though not in all cases. With pens left vacant for 14 days the sheep put in remained healthy.

It is clear from these observations and experiments that persistence of Scab on sheep farms, and recurrences of disease after intervals of weeks or months, are not due to survival of the parasites or their eggs off the sheep, attached to posts, fences, &c., or on the ground, and they leave no other conclusion possible except that infection, when it persists, does so on the sheep.

SEASONAL PREVALENCE OF SCAB.

The graph (Fig. 8) on opposite page, showing the outbreaks of Scab reported in Great Britain over a period of three years, is quite representative of the state of affairs in other years. It will be seen that the number of outbreaks reaches the maximum about January, when it begins to decline, and the disease would appear to be almost non-existent in the summer months, but the outbreaks rise again in frequency in October, and the curve ascends until the January following.

This curious feature of Sheep Scab has been the subject of investigation by the writer, who has found it to be more apparent than real. It would not be exact to say that Scab is seasonal. Scab may be on the sheep in the summer months as well as in the winter months. The writer has, moreover, been able to infect sheep experimentally in summer as in winter, and has seen the disease progress in the infected animals. Still, it can be stated that, given sheep experimentally infected in the winter months, the symptoms die down in the spring and summer, and in some cases may even cure spontaneously. In others, however, it reappears in the autumn and winter without fresh infection. The same thing seems to occur in sheep infected naturally in the field of practice. The true meaning of this is that Scab does not disappear in summer, as the records of reported cases seem to show, but its manifestations are infinitely less in evidence. The reasons for this will be examined later, but it will be of interest here to give particulars of some such cases selected from a number of animals experimented upon and observed.

The sheep referred to in these observations were kept in

pens in the open and separated from all other sheep, so that the question of reinfection at a later date could not arise.

(1) Ewe 72 was infested on 3rd October 1908, and was

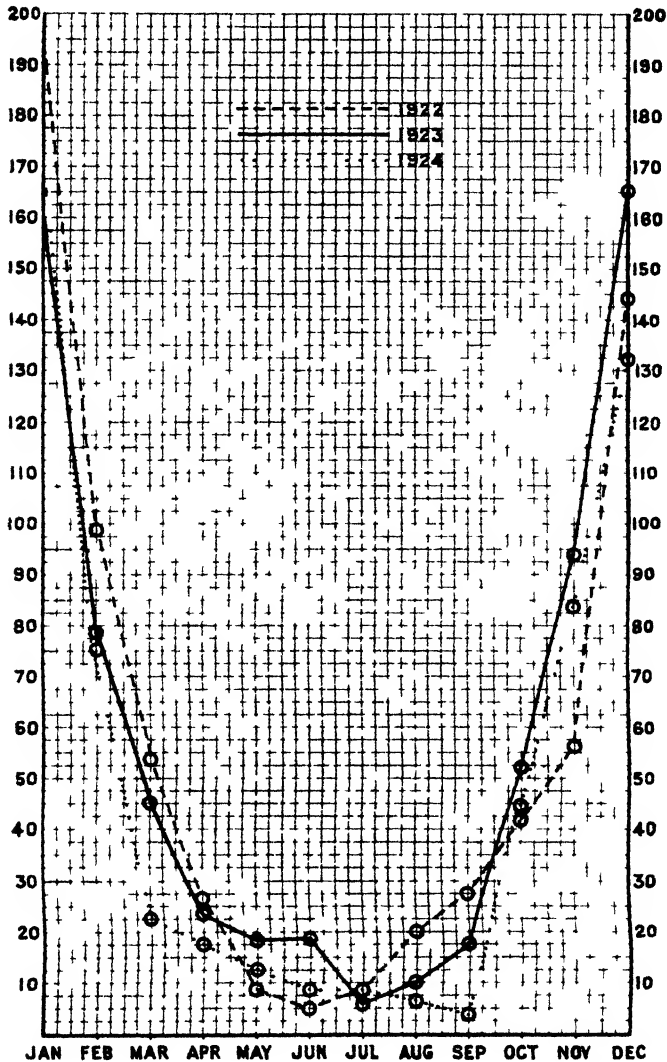


Fig 8 — Seasonal prevalence of Sheep Scab represented by number of outbreaks

afterwards kept under close observation. One adult only was found at the site of infestation by the 14th day. It was not until 26th November (54 days) that the acari were num-

erous, and the symptoms quite evident. This observation does not mean that in every case it will be 54 days before the symptoms become noticeable. It may take a shorter time, and it will also be seen later that, after ineffective dipping of scabby sheep, the return of symptoms may not occur for a very much longer time. In Ewe 72 the disease had spread all over the body by the 3rd February 1909, and acari were numerous. From the 16th March until the 19th December frequent examinations failed to show any acari, and the skin and wool became quite normal in appearance. There was no relapse.

(2) Two sheep infested experimentally in December 1910 had a severe attack of Scab. From May to early October 1911 no acari were found on them by careful searching, and the sheep looked clean. Later in October (after 5 months) the disease reappeared, extending from the tail, where the acari had apparently been sheltering in the quiescent state.

(3) Sheep experimentally infested in October 1910 had a severe attack. No acari were found from March to October 1911, and the sheep appeared to be cured. Late in October 1911 (after 7 months) disease reappeared, extending from the tail.

(4) Sheep infested in October 1910 had a severe attack of Scab. From February to September 1911 no acari were found, and the sheep appeared to be cured. Late in September 1911 (after 7 months) the disease reappeared, extending from the tail.

INTERVAL BETWEEN INFECTION AND APPEARANCE OF CLINICAL MANIFESTATIONS.

Closely related to the question of so-called seasonal prevalence is that of the interval between contact with infection and the appearance of visible symptoms. If a sheep be experimentally infested with acari, even in much larger numbers than it is likely to pick up by contact in practice, it does not show visible symptoms before the 25th or 30th day. By this time there are, under favourable conditions, three broods of the parasite at work on the skin, amounting to several millions. It does not always happen, however, that clinical symptoms are in evidence after this period. Experiment has shown that breeding and progression of symptoms may be delayed. It has also been shown in the previous section that when the symptoms die down, as it were, in the spring, it may be several months before they reappear, although infection is somewhere on the sheep in some form all the time. It is well known also that one dipping, or for that matter several at long intervals, in any of the dips at present available cannot be depended upon to cure

Scab, and that if scabby sheep be dipped in this way the disease reappears later. In an experimental observation by the writer a scabby sheep was dipped once and thoroughly soaked. The sheep was kept in an isolated pen, and no living acari could be found for months after the dipping. Over four months after dipping, however—in the autumn—a patch of Scab was found about the root of the tail, from which disease spread to the body.

These experimental observations have their counterpart in practice. In fact, it was with the object of seeking confirmation and an explanation of certain happenings in practice, which seemed curious, that these experiments were designed. Examples of these happenings in practice may be usefully cited, as they have a most important bearing on the handling of Scab by administrative measures:—

A farm sale was held on premises where Scab existed, but had not been reported. Just previous to the sale all the sheep had been dipped once. The sheep were distributed on 24th September to five different premises, previously clean, where Scab broke out in the months of December and January. The intervals between the sale and the appearance of Scab on the five different premises varied from 78 to 102 days. The following Table is also of interest, as it gives notes on a few selected outbreaks amongst sheep, which inquiry showed had been inefficiently dipped (in some cases a single dipping) some time before the outbreak was declared, and in which the introduction of infection after the dipping could be excluded.

TABLE II.

	Sheep on farm	Number visibly affected	Interval of contact with infection	Interval between dipping and recurrence of symptoms	Number visibly affected at time of recurrence.
1	114	3	—	81 days	18
2	78	10	8 months	4 months	2
3	40	8	5 "	3 "	33
4	250	9	4 "	7 "	
5	153	1	2 "	—	
6	205	—	—	3 months	80
7	81	20	6 months	10 "	5
8	140	10	—	10 "	3
9	10	—	5 months	4 "	10
10	38	—	4 "	4 "	8
11	8	—	4 "	2 "	2
12	42	—	—	8 "	18
13	16	—	—	4 "	1
14	30	—	2 months	2 "	1

In considering the above data, which are only those of one series, due allowance must be made for a certain lapse of time before the owners suspected or reported. The length of that time, however, is to some extent controlled by the number of sheep the veterinary inspector was able at his visit to pick out as visibly affected, and in several cases they were not numerous. With the most generous allowances of the kind, the intervals still remain strikingly long.

Further, it has not infrequently occurred in trying to trace the origin of a series of outbreaks, that the line back from each has converged on the same farm, from which sheep had been moved to the infected places several months previously, and notwithstanding the weight of circumstantial evidence against the farm, no visible disease has been found in the remaining stock. The owners of these farms have been found to be what is generally described as good flockmasters, in that they made a practice of dipping their sheep once or oftener each year, but in the latter case never with the intervals between the dippings properly adjusted to fit in with the life-cycle of the parasite. It is possible for such a flockmaster to remain for a long time in the honest, though mistaken, belief that his sheep are clean, yet when they are removed to other premises, the owners of which do not practice routine dipping, the sheep may, and often do, give rise to outbreaks.

When seeking for reasons to account for the apparent decline of Scab in the spring and summer months, and for the more or less long intervals which may occur between contact with infection and the appearance of visible symptoms, several suggestions arise in the mind, such as the effect of shearing, the improvement in the bodily condition and natural lubrication of the skin when the grass begins to grow, the comparative absence of active interchange of sheep in the quiescent period, and the effect of summer dipping. When looked into closely, however, none of these factors can be held to offer a complete explanation, although they are not without some influence.

When shearing is practised on a scabby sheep a marked degree of amelioration of symptoms may undoubtedly take place. On the other hand, the writer has had no difficulty in infecting experimentally newly-shorn sheep, and in practice the decline of the curve (Graph I.) is in active operation before general shearing begins. Improvement in the bodily condition, accompanied by an oily state of the skin, does not seem to be favourable to the breeding activity of the parasites thereon; but although it is more difficult to infest a well-conditioned sheep, such an animal is by no means proof against experimental infestation with Scab.

The absence of interchange of sheep must obviously decrease the opportunities for dissemination to other premises, and

remove the factor which accounts for new outbreaks, but it cannot explain the apparent decline of Scab in the infected flocks.

Summer dipping, which is a single dipping, can be counted on to effect an apparent cure for the time being, as already explained, but it cannot be accepted as fully explaining the seasonal decline, and the long period of quiescence before it lights up again, because the decline begins before the time of summer dipping, and without its intervention, as regards experimentally observed sheep, the same phenomena occur. Shilston, who subsequently examined the same epizootiological problem, which he found also to occur in South Africa, suggested with considerable reason that they might be explained by the greater amount of yolk excreted and retained near the skin in the warmer months of the year (these being from September onwards in South Africa). He compared the behaviour of acari placed on two patches of skin, one well greased with yolk, and the other degreased. In the former the parasites bred and developed, but more slowly than in the latter, and at the end of six weeks they had disappeared entirely from the former, while they were present in great abundance in the latter. This evidence distinctly favours the view that the phenomena referred to arise as regards the psoroptes (a surface parasite), owing to the improved condition of the sheep and the well-lubricated state of the skin consequent thereon. The explanation is not, however, entirely satisfactory, and the subject invites further research.

MEASURES AGAINST SCAB.

Under this heading it will be taken as accepted that Scab is spread by contact, and disseminated by the movement of sheep from infected farms to other farms, either directly or through dealers or markets, and that the measures against Scab must include control over contact and movement. It is not that side of the question, however, which is under discussion, but rather the kind of measures which can be taken by owners themselves to enable control to be reduced to a minimum, or even dispensed with.

From what has been said, it will be obvious that Scab may exist in flocks which the owners believe to be clean. That, however, does not necessarily mean that the owner is always justified in so believing, since his belief may be founded on an insufficient knowledge of Scab. If Scab has been unknown in a district for a year or two, and no sheep have been brought on to a farm from other less fortunate districts, there are reasonable grounds for believing it does not exist. If, however, a man is dealing in sheep, or is con-

stantly bringing new sheep on to his premises without taking precautions, he runs considerable risk, and is seldom in a position to assert that his sheep are free from all suspicion. The measures giving a reasonable guarantee which owners may apply themselves are well known. They consist in dipping the affected or suspected sheep in a bath designed to kill the acari. Another method, which is known as salving, soaking the skin with oily material containing a suitable anti-parasitic substance dissolved therein, is also effective, but it is inapplicable to flocks, owing to the labour and expense involved. For dealing with old patches of hard Scab, however, it is an excellent supplement to dipping.

It is not within the scope of this article to describe the various designs of dippers. It may be said, however, that sheep can be efficiently dipped in a tub, but when this method is used they seldom are efficiently dipped, unless the tub is deep enough to allow the sheep to be completely submerged. The dip, to be effective, must reach every part of the skin where there are acari, and since nobody can say with regard to affected or suspected sheep where there are no parasites, or eggs which may hatch, the dipping substance, to be effective, must reach the entire surface of the body and limbs. This is most conveniently and economically accomplished by the swim-bath, with sloping drainer attached to the distal end, in which the sheep stand until the excess dip from the wool has dripped, to be returned to the bath. The writer prefers the small swim-bath, in which each sheep can be caught midway by an operator, who, supporting the head, moves the animal backwards and forwards for a few moments to effect penetration of the liquid through the wool to the skin. The time a sheep is in the bath is not the true criterion of effective dipping: penetration of the dip is the important point. For reasons already mentioned, care should be taken to see that the region of the tail and rump, which is carried high when swimming, is thoroughly soaked. The same applies to the head and ears, which are not infrequently refuge places for the acari. The practice at the Ministry's laboratory is for one man to lower each sheep perpendicularly, hind end first, into the bath, and for another to catch it by the nose midway in the bath, move it to and fro, finally ducking the head twice.

THE NECESSITY FOR TWO DIPPINGS.

Although there are many substances which are effective in destroying the acari, none of the known dipping agents can be relied upon to destroy the eggs. It is correct that some of them—those of the phenol type—are more destructive than

others to eggs which have undergone a certain period of incubation, but it is none the less true that some eggs, probably those just laid, almost invariably escape destruction, and hatch out later.

It has been said that the dip which remains in the fleece destroys the larvæ as they hatch out. That, however, is not in accordance with fact, and practically all sheep involved in the outbreaks during many years had been dipped once in the year, or twice, with a long interval between, which is the same thing. A second dipping, then, is essential to make the treatment effective. The interval between the first and second dipping is of primary importance. It must be designed late enough to ensure that all the eggs of the old brood, now presumed to be deceased, will have hatched out, and early enough to catch the acari of the new brood before they have reached the egg-laying stage. By reference to the paragraph on the life-cycle and habits of the parasite, it will be seen that most of the eggs are hatched in from 3 to 4 days, and those unhatched by the eighth day are unlikely to hatch at all. It will also be seen that the life-cycle for all practical purposes may be taken as occupying 12 days. The second dipping, therefore, should not be earlier than the eighth day after the first, or later than the twelfth.

Care must be taken that no sheep is omitted at either the first or second dipping, otherwise the whole undertaking may be undone. It is sometimes stated that lambs need not be dipped, as they do not contract Scab. That is an absurdity, though it is correct that, probably for similar reasons to those discussed under delayed breeding and progression, lambs are often slow to develop visible symptoms, as the following observation, one of a series, shows: A ewe was infested with Scab parasites, and a lamb was placed in contact in a pen. Acari were found on the ewe on the 24th day, but they were not numerous. The lamb did not show symptoms until the 11st day. The attack was mild, though distinct. No acari could be found on the lamb after three months (end of May), and the lesions had healed, though no treatment had been applied. This observation was made in the open in the spring—that is to say, when the Scab curve declines (see Graph I.) It is not necessarily intended to suggest that the lamb became free from the parasites of Scab, only that the visible symptoms disappeared for the time being, and similar cases have already been quoted in which there was a return of the symptoms in the autumn.

Certain other fallacies are sometimes maintained regarding the harm arising from dipping, especially double dipping. Given a non-poisonous dip and the absence of inclement weather, frequent dipping of itself has no materially bad effect on sheep, provided also they have not to be driven

excessively long distances to and from the dipper. This, however, ought not to be necessary, as the requisite number of dippers should be a recognised provision on a sheep farm. The writer, at his field laboratory and on a farm in Scotland, has caused sheep to be dipped once a week during a month for the destruction of ticks, and no harm resulted. It has also been seriously maintained that, if ewes with sucking lambs be dipped, they are unable to identify each other thereafter, and that the lambs perish miserably of starvation. The writer has tried this out repeatedly, and found it to be erroneous, the lambs and ewes pairing off, as it were, after dipping, without difficulty.

A matter discussed from time to time is whether dipping against parasites of the skin in general is more effective on sheep unshorn or after shearing. There are two sides to this question, as in many others. The important point is to attain effective and complete penetration of the agent. In a neglected sheep, with long, felted, or greasy wool, this is not an easy matter, but the number of such sheep ought to be few, and it may be conceded that they require special treatment. *Prima facie*, the dip should reach the skin more easily in the case of shorn sheep, but there is very little in this when the sheep, as it ought to be, is kept for from half a minute to a minute in the bath, and moved to and fro. A fair covering of wool has a distinct advantage, provided the sheep are not simply plunged into the bath and out again, as is so often done. The soaking of the wool prevents rapid drying, and ensures a much longer application of the agent than would be practicable by keeping the animal in a bath. This has obvious advantages in the case of dips having a direct action; they are less obvious, but probably more important, in the case of dipping agents which have also an indirect action through their products of decomposition—sulphur dips, for example. Theoretically speaking, when it is found impracticable to dip all the suspected sheep on one day, and also to keep the dipped animals separate from those which are awaiting dipping, the risk of letting them run together is not serious, provided all are to be dipped or redipped, as the case may be, within ten days. Similarly, if in bringing new sheep on to the farm they are properly dipped once before being put with the old stock, there is no very great risk in mixing them, provided they are dipped a second time within ten days, as the first dipping may be expected to kill the acari, and only a few eggs are likely to hatch. This, however, should not be practised unless it is quite impracticable to carry out separation.

DIPPING AGENTS.

All dips used in Great Britain for statutory dipping under the Administrative Orders of the Ministry of Agriculture and Fisheries must be authorised by the latter. They are authorised in accordance with a standard set up by the Committee on Sheep Dipping (see Report Cd. 2258 of 1904).

The active ingredients belong to the class of drugs known as insecticides, but it must not be inferred that all insecticides are lethal to acari, or that the killing power of those which may be classed as acaricides is equal. They are all more or less poisonous in the strict sense, but not necessarily by application to the skin. Among the principal acaricides are found arsenic, sulphur, crude phenols, the tar oils and tar acids, tobacco, derris root, &c. Most of the sheep dips on the market in Great Britain are of the arsenical, crude phenol, tar oils and acid, or sulphur compounds, type.

Arsenical Dips are intended to be applied in true solution, although in badly-compounded dips there may be arsenic in insoluble form, which is liable to cause scalding. They depend for their killing power on the well-known poisonous properties of arsenic, but it is also said that by a temporary hardening and roughening of the skin they render it unsuitable for the purpose of feeding. The arsenical dips are of the poisonous class, inasmuch as they do sometimes irritate and excoriate the skin, which then permits absorption of the arsenical fluid to take place at the second dipping, maybe with fatal results. They are slow killers of the acari, some of which may be found alive for a few days after the first dipping. It has been advanced, and at least one important action at law has been decided against the plaintiff—the farmer—on this view, that poisoning after dipping is due to the sheep being put on the pasture before their wool was properly drained, and that poisoning followed owing to the drippings impregnated with arsenic falling on the grass upon which the sheep fed. That this may happen, especially when rain falls heavily on newly-dipped sheep, is possible. If it were of high importance, however, cases of poisoning should occur much more frequently than they do, and with equal frequency after the first and the second dipping, which is not what happens, poisoning being much more frequent after the second dipping. The writer, moreover, has met with cases of poisoning after a second dipping in an arsenical dip amongst sheep which, following upon draining, were put on bare land and fed upon hay. It must be known to farmers, however, that many thousands of sheep have been dipped in arsenical dips without accident, and there is no good reason to believe that a single dipping is attended with very serious risk, unless the skin has been previously injured.

As explained, the dipping for curing and preventing the development of Scab must be double, with a short interval; the risk may be greatly lessened by using for the second dipping a weaker solution, or by using one of the non-poisonous dips.

Crude phenol, tar oils and tar acid Dips.—These agents are sparingly soluble in water, but by emulsifying the crude material it can be prepared in a form which gives a very fine colloidal suspension in water. As marketed they are of a brownish-black colour, and of thick oily consistence. When added to water the mixture takes a dense cloudy appearance, and very fine oily globules float on the surface. They do not give a true solution, but rather a colloidal suspension, and no small part of their efficacy is attributed to their application in this form. If a mixture of such a preparation be made in a tall and narrow utensil of glass—say, a measure-glass,—and if it be well shaken up and allowed to stand for some time, it will be seen that the cloudiness becomes thinner at the top as the suspended material separates. The more slowly this occurs, the better is the emulsion, and the change ought not to be very perceptible for some hours. Certain kinds of water—peaty water, for example—do not form good suspensions, and it is certainly advisable that a dip should be selected with due regard to its mixing and soluble properties with the water available in a district.

Lime-and-Sulphur Dip.—Few such dips are on the market in this country, owing largely to the difficulty of preparing them in concentrated form for transit. It can, however, be prepared on the farm. The South African formula, which is as follows, is claimed to be the most economical: hot lime 9 lb., flowers of sulphur 18 lb. The lime is powdered and mixed with the sulphur. The most convenient way of proceeding thereafter is to place the mixture in a sack, submerge and suspend it in a boiler containing at least 10 gallons of water, so that the sack does not come in contact with the walls (to avoid scorching), and boil slowly for an hour, when the fluid will have acquired a reddish-yellow colour. Take off the fluid. Add another 10 gallons of water, and boil up again for half an hour. Again remove the fluid, and allow the contents of the sack to drip. The fluid from the boilings is sufficient to make 100 gallons of dip. Dip made in this way contains a high proportion of polysulphides, which, being unstable, are easily converted into the combinations of sulphur, which are poisonous to acari. Sulphur combinations are amongst the most successful acaricides, and dipping therein can be carried out with great frequency and without accident. It is also a repellent, but it should be noted that the repellent action of dips is often exaggerated; none of them maintains this action for any long period. At the Weybridge laboratory,

which is in a district badly infested with green-fly (*Lucilia sericata*), it is customary once a week to drive all the sheep (usually about 100) through the dipper containing the lime-and-sulphur mixture, which is made to do duty for several weeks, with the necessary addition to keep up the volume. The dip does not kill the maggots, which, if present, have to be otherwise dealt with, but as far as repellents go it repels the fly.

DISINFECTION OF THE PASTURES.

The disinfection of sheep pastures is not altogether a simple problem—on hill pastures, for example. Fortunately the acari do not live for long periods away from their hosts, and scabby sheep after dipping are not so attracted to the rubbing posts. Given sheep dipped for Scab on a certain day, it is unlikely that acari, say, from the rubbing posts, will be able to establish a footing on them before the second dipping within 12 days, and the latter dipping will in all probability catch any which may have managed to do so. After the second dipping there will be protection against invasion for a further few days, which will bring the period during which the acari in tufts of wool have been away from their hosts up to about 15 days. After being 15 days away from a host, the acari which may have survived usually fail to establish themselves, even if they then reach a host. Nevertheless it is advisable to carry out as much disinfection of the pastures as is practicable, and a good deal can be done on the ordinary lowland farm upon which a few hundred sheep are kept. Various methods are effective. The tufts of wool on the ground can be raked up and burned by sprinkling them with a little petrol or paraffin and setting on fire, or they can be sprayed with a 3 per cent solution of disinfectant of the phenol type. The fences, rails, &c., can also be dealt with by spraying. Where there is no danger of starting a fire, the wool can be conveniently destroyed by using a blow-lamp.

It is not within the scope of this article to discuss in detail the administrative measures which the Central and Local Departments of Control could usefully take with the object of eradicating Sheep Scab, but, in the view of the writer, one of the essentials of success must be to put on owners themselves some of the principal obligations. Under the Sheep Scab Order of 1923, occupiers of farms, holdings, and owners of sheep on commons, are obliged, under penalties for failure to do so, to take such steps as are reasonably practical to secure that their sheep are free from Scab. The Ministry of Agriculture issues a pamphlet, A 63/T.A., on the responsibilities of sheep-owners as regards Scab.

IMPORTANT POINTS REGARDING CURE, PREVENTION, AND DIPPING.

It will be useful to conclude by drawing attention shortly to some of the important points to be observed for the cure and prevention of Scab :—

1. Avoid putting new sheep, especially those bought from a market or a dealer, in contact with a clean flock until they have been double dipped.

2. In dipping for Scab, employ the best acaricide, without regard to its effect on other less important parasites of the skin, and mix it in strict accordance with the instructions.

3. Take care that all the sheep intended to be dipped are collected, and that all go through the bath ; otherwise the labour may be all for nothing.

4. Hand dress (say, with a mixture of oil, spirit of tar, and sulphur) any very old lesions observed on a sheep about to be dipped.

5. See that each sheep is completely submerged in the dip, and that it is moved to and fro to assist penetration of the fluid, that it does not emerge from the bath under half a minute, and that special attention is given to the tail, rump, head, and ears.

6. Remember that a sheep in wool removes about half a gallon of dip from the dipper, and that the volume of the bath must be renewed from time to time to allow of complete and safe submersion.

7. In making good the volume, calculate the number of gallons of fluid to be added, measure out the requisite amount of dip for this quantity, dissolve it thoroughly in buckets of water, and add it to the bath after the volume of the latter has been made up with water less the amount in the buckets. Do not simply pour or shake concentrated dip into the bath, and do not guess at quantities.

8. See that the bath is well stirred up from time to time with a broom, especially after addition of fluid.

9. Allow the sheep to drain on the drainer, and do not let them return to the pastures until all serious dripping has ceased.

10. As far as possible prevent dung from entering and remaining in the bath ; it fouls the wool, and detracts from the efficacy of the bath.

CLAY FARMING AND ENSILAGE.

By JAMES CRUICKSHANK, Cruden Bay.

As good grass and ensilage go well together, the former providing the summer feed and the latter the winter feed, I shall begin with a few remarks on the improvement of grass.

Ever since I have taken any interest in farming I have held the opinion that in dealing with clay land the first thing to do is to improve the grass. Much of the heavy grass land that is now producing less than 1 cwt. per acre of live-weight, on cattle or sheep, could readily be made to produce double this amount, and in exceptional cases up to 3 cwt. per acre.

Clay land farms must always have a large proportion in grass—more so than ever now, when labour forms such a large part of the farmer's outlay. It is an interesting fact that farms which went down to grass in the late 'seventies and early 'eighties have not changed hands so frequently, nor varied so much in rent, as did those which continued in cultivation.

Anything in the nature of a short rotation, or much grain growing, is out of the question on land such as I farm, and there is much of the same sort of land in the north-east of Scotland. With the area of grass so much larger than the area in other crops, much good can be done by improving grass land. By the aid of suitable seed mixtures, including wild white clover, and with plenty phosphates at pre-war prices, an excellent and permanent pasture can now be got in three years' time which used to take ten years to make.

Given good grass, good crops of anything else the land is suited for will follow. Nothing is more likely to produce a poor grain crop than ploughing down poor weedy pasture.

IMPROVEMENT OF PASTURES.

The first step in the improvement of pastures is to make the most of what is already there by suitable manuring. A great improvement may be effected by the application of 10 cwt. per acre of basic slag or ground mineral phosphates in autumn. The rough grass should be harrowed in winter to break it up, or eaten down as much as possible by means of rough cattle, such as West Highland or Shetland bullocks, or Galloway cows and calves. It is surprising how much im-

provement can be made in this way. In the second season, after sowing the phosphates, the cattle eat down the rough grass wonderfully in trying to get at the green shoots of grass and white clover started away by the manures.

By repeating this manuring every third year with about half the quantity—say 5 cwt. per acre—the grass will go on improving until at least over 35 cwt. per acre have been applied. I hope further improvement may follow further applications, but this is as far as my experience goes. The application of 10 cwt. for a start gives, in my experience, much better results than 5 cwt. applied at intervals. The larger quantity seems to be necessary to start the white clover properly, and 5 cwt. at intervals of three years is then sufficient.

The manure, whether slag or ground mineral phosphate, should be applied as early as possible in autumn, so as to be of service during the following summer. The phosphates should be in a finely-ground condition, if possible of a grade of which 80 per cent will pass through the 120 sieve.

In dealing with clay land, I have not mentioned the use of potash in the manuring. Clays in the north-east of Scotland, being of glacial origin, usually contain sufficient potash. Clays deposited as silt, on the other hand, may be lacking in potash, but careful trial and experience will soon show this. More than likely, at the end of three years' time, this grass will be fit to break up, and will yield a good grain crop.

Although I have tried liming grass on several occasions, I cannot say much apparent benefit has resulted. On the other hand, an application of two tons of lime carbonate on the pasture just before ploughing up has a very beneficial effect on the succeeding crops. It also helps the drainage and improves the tilth to an appreciable extent, and helps the grass when sown out again.

NURSE CROPS.

The best pasture, of course, is always got by breaking up the poor grass and taking one or two grain crops, which may or may not be good, according to the season, and either attempting turnips, followed by a grain crop, or bare-fallowing and sowing autumn wheat, or, as shown later, by replacing by a silage crop and sowing a suitable seed mixture.

The best take of grass or clover seeds is always got with bare as a nurse crop, although I prefer the bare fallow and wheat. In a normal season it cleans the land thoroughly, saves the risk of the turnip crop, and also avoids the poaching of the land in carting off the turnips, if you are lucky enough to have a good crop. The poorest grain crop I ever had was

in 1916, after a wet winter, when the land was badly poached in carting off a good crop of turnips. The yield of grain was less than 2 qrs. per acre. All this risk can be avoided by the usage of silage crops.

Wheat provides a lot of straw for litter, and usually yields $4\frac{1}{2}$ qrs., although I have had $5\frac{1}{2}$ qrs. and 6 qrs. occasionally. The grass seeds do very well sown in April on the autumn-sown wheat, mainly on account of the fine frosty tilth there is to sow them on.

Of course this refers to the north-east of Aberdeenshire. The best results here are always got from well-matured English seed wheat, which can be drilled with $2\frac{1}{2}$ to 3 bushels per acre.

A rigid rotation cannot be profitably adhered to in clay land farming, and I consider it good policy to break up the poorest grass whatever its age, and keep a large proportion in good grass. Get such grain crops as can be got by treating with 2 to 3 cwt. supers and 1 cwt. sulphate of ammonia, which will invariably be a profitable outlay.

After taking one grain crop, in the absence of a silo the choice lies between a bare fallow and turnips, and each must decide from his own circumstances which will suit best. The bare fallow has proved best with me every time, although it is now almost out of date, and considered poor farming. To my mind it is nothing like so poor or costly as the failure of a turnip crop.

If turnips have been tried, the following crop should be common bere. If this is sown thinly, $2\frac{1}{2}$ to 3 bushels, drilled in, it is a very safe crop. Too thickly seeded, it will be a failure. I have never yet seen a crop of bere too thin, but nine out of every ten are too thick. I have repeatedly grown 5 to 6 qrs. bere where 1 to 5 qrs. oats would have been the maximum yield. Bere is nearer the ground when maturing, is early cut, and the clovers and grasses come away well. The sowing of bere has gone out very much, owing to its usually selling at 1s. to 2s. per qr. less than barley, and its unpopularity with distillers. It germinates more quickly than barley, and upsets the regularity of the maltings. It is equally good for feeding, and it is now almost entirely used for this purpose. When small cargoes could be offered it was very saleable to send to west coast distilleries, and as late as 1896 cargoes of bere were shipped from Cruden Bay, showing how popular it was in this clay district.

NATURAL GRASSES.

Although natural grasses, such as cocksfoot, Timothy, meadow-fescue, rough-stalked meadow-grass, and crested

dog's-tail were well known in Aberdeenshire and strongly recommended by Dr James Anderson, Monkshill, Aberdeenshire, in his essays on agriculture published in 1774, they were not generally sown in this district until recent years. I presume the short rotation had a good deal to do with this, the rotation being until recently the five course, and a little earlier the Norfolk four course, and only when turnips began to suffer from finger-and-toe did the rotation begin to lengthen.

Although the Highland and Agricultural Society offered premiums for essays on the improvement of pastures seventy years ago, little seems to have been done in this direction. In 1851-56 James Black, factor, Ellon, Aberdeenshire, describes an experiment which he carried out on a 20-acre field at Ellon in 1847, which showed clearly that 10 lb. perennial and natural grasses, with clovers, gave a much higher yield of hay than 2 bushels perennial with clovers only. In the second year the pasture, after the 10 lb. perennial, was worth 10s. per acre more than the other, and in the third year was much superior. Why this information was not acted upon does not seem very plain, but up to nearly twenty years ago it was the regular custom to sow $1\frac{1}{2}$ to 2 bushels perennial, 30 to 50 lb. per acre.

One of the earliest efforts in the improvement of grass seed mixtures to achieve any measure of success emanated from Mr R. H. Elliot of Clifton Park. His mixtures, although popular and successful in the Border districts, were not sown largely in the North. They were expensive, and many of the seeds recommended were of little value. I tried them all, but soon came to the conclusion that cocksfoot, Timothy, and rough-stalked meadow-grass were the only ones worth sowing on clay soil. I do not like crested dog's-tail on clay soil. It soon takes possession, and no stock will eat the hard and wiry stems and seed-heads. Rough-stalked meadow-grass takes its place much more profitably.

EFFECT OF SOWING TOO MUCH RYE-GRASS.

The greatest drawback to the improvement of grass was the persistence in sowing large quantities of perennial rye-grass, as much as 50 lb. per acre being quite a common quantity to sow; and even if a fair quantity of natural grasses were sown along with this mixture they were choked out, and did little good, especially when ploughed up the second or third year.

A really good pasture cannot be got unless the seed mixture is suitable. The experiments at the North of Scotland College of Agriculture, started by Robert Greig, F.H.A.S., F.R.S.E.,

now Sir Robert Greig, and William Findlay, N.D.A., did much to stimulate the sowing of a proper mixture of perennial and natural grasses. The results of these experiments are published in Bulletins Nos. 15 and 18 of that College, both most valuable articles. No. 15 in particular is short and concise, and should be read by every farmer in the North. These experiments proved that the excessive use of rye-grass suppressed the natural grasses, and never allowed them to develop to prove their value.

SEED MIXTURES.

The following I have proved to be a very suitable seed mixture for this district, and it has the advantage of being inexpensive :—

9 lb. perennial rye-grass	} or 12 lb. perennial without
3 lb. Italian rye-grass	
10 lb. cocksfoot.	Italian.
6 lb. Timothy.	
1 lb. rough-stalked meadow-grass.	
1½ lb. late flowering red clover.	
1½ lb. broad-leaved red clover.	
½ lb. common white.	
1 lb. wild white.	
½ lb. Alsike.	

The seeding of wild white may appear heavy, but more seed is required on clay land than on lighter soils where the tilth is finer. The heavy seeding of cocksfoot produces a finer grass than a lighter seeding, and does much to suppress Yorkshire fog and the persistent daisy. This mixture, if well supplied with phosphates, will keep green all the year round if properly grazed, and will eliminate weeds to a large extent, and give a good grain crop when broken up. The wild white and natural grasses in the seed mixtures now show plainly all over the district, and their use is rapidly increasing. The fields sown with these can be readily detected at a distance.

Much of the success or otherwise of a pasture depends on the management. It is specially important on clay soil not to allow the young grass, after the grain crop, to be pastured either by cattle or sheep. I have found it wiser always to cut the young grass for hay the first season, and particularly to cut it early, and what is lost in weight of hay is gained in quality and aftermath. If young grass has been poached by stock during wet it never fully recovers. For this reason it is particularly necessary on a clay farm to have some old grass to put the stock on during wet weather to avoid the risk of doing damage to the young grass. I often take hay

off the second year as well, with no harm, but rather benefit, to the subsequent pasture, always cutting on the early side. Many pastures are spoiled by letting them get too rough. The value in a pasture is not by any means in the bulk, and by keeping it close to the ground in winter, the white clover will develop more readily, and much finer quality will result.

Pastures can be much better grazed and kept in better condition by a mixture of cattle and sheep than by either alone. More live-weight can be obtained per acre, and it is this that counts.

TIMOTHY MEADOWS.

Timothy as a hay crop is very useful on clay land, but is little grown in the North. I have grown this for a good many years. In the Carse of Stirling, and from Perth to Dundee, and in the West, it is a standard crop. It can be cut year after year, and is always safe for a yield of 2 to 3 tons per acre with suitable treatment, and the hay is very easily cured. It may be seeded down in the same way as other seeds on well-cleaned land after turnips, or after a bare fallow, or after silage. 20 lb. Timothy, 10 to 20 lb. Italian rye-grass, and 6 lb. red clovers is a very useful mixture to sow. The first crop of hay will be largely Italian and red clover. This clovery crop I have occasionally put into my silo, and excellent silage it makes. The second year the hay will be nearly all Timothy, and should get 1 to 2 cwt. nitrate of soda or sulphate of ammonia per acre. A common practice is to give dung and artificials in alternate years. In my opinion artificials every year is preferable, as the dung seems to encourage weeds, particularly Yorkshire fog. Such a meadow I have cut for thirteen consecutive years, with a yield never less than 2 tons per acre, and in 1916 almost 4 tons per acre. A vigorous harrowing occasionally in mid-winter is very helpful in keeping the Timothy free from weeds.

CAKE FEEDING ON PASTURES.

At Cockle Park Professor Gilchrist proved conclusively that cake-feeding on pasture steadily deteriorates the grass over a period of years, while the use of phosphates steadily increases the value of the pasture. Potato growers who feed cake largely on the grass may get their money back in the potato crop, but I am satisfied that heavy cake-feeding on permanent pasture or grass that is to be down for five to six years is a mistake, and that much better results would be got by a liberal application of phosphates and, where necessary, potash in addition.

WILD WHITE CLOVER.

The crowning point in the improvement of pasture was the introduction of wild white clover, and it would be difficult to estimate the value of this improvement. The first field I sowed with wild white was in 1910. The effect was not very pronounced till three years after (in 1913). In July of that year it was specially pronounced, and, as the first field in the district, attracted a good deal of attention. I calculated it



Fig 9 Wild White Clover, Frolston, Cruden Bay. July 1913.
Sown out April 1910

doubled the stock-carrying capacity of the land straight away. The stock "did" very much better on the wild white pastures.

The land, while under cultivation, had got 2 tons lime carbonate per acre, along with liberal supplies of phosphates to the crops grown, and 10 cwt. high-grade slag on the young grass immediately after the grain was off. Previously I used to feed cake on the grass all summer, with beans, tares, peas, and oats cut green and carted into the fields in autumn, both to cattle and sheep. On the cattle the best gains I got previously, over a period of 150 days with Irish bullocks, was 2.09 lb. live-weight increase per day. After improving the

grass I found I could get 2 lb. per day easily over the same period without cake or tares. I tried this repeatedly, and I give a single instance.

In 1920, fifteen yearling bullocks and fifteen yearling heifers made an increase of just over 2 lb. per day for five months (from 11th May to 4th October) on pasture without any artificial feed. To be exact, the heifers made an increase of 298 lb. and the bullocks 305 lb. in 146 days.

Good pasture, with wild white, will readily yield over 2 cwt. live-weight per acre in the grazing season. In 1921,



Fig. 10.—Part of a lot of 30 yearling bullocks and heifers which made a live-weight increase of 2 lb per day for 146 days on pasture only (1920).

a fine dry season, a field of $13\frac{1}{2}$ acres in third year's grass yielded as follows :—

14th May to 25th June.

Grazed by 31 yearling bullocks.

		Cwt.	qr.	lb.
Live-weight increase in 42 days	.	23	1	0

5th July.

Mower run over, and 6 tons rough hay,
mostly cocksfoot, taken off.

17th August to 17th September.

Grazed by 28 of same lot of bullocks.

Live-weight increase in 31 days	.	15	2	0
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1st October to 2nd November.

Grazed by 17 Shetland bullocks.

Live-weight increase in 32 days	.	4	3	12
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43	2	12
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In addition, there was a considerable amount of sheep grazing in late autumn.

The half-bred lambs that used to get cake from June onwards now get fat, from August to November, without any cake or artificial food.

EFFECT OF WILD WHITE CLOVER PASTURE ON GRAIN CROPS.

I did not break up any fields sown down with wild white in the mixture for some time, but when I did the result in



Fig 11. *Oats. October 1913. After poor grass.*

the grain crop was little short of marvellous. The first field of this sort broken up had a rig in the middle that had no wild white clover in the mixture, but common white only, and when in oats this rig could be picked out as far as you could see the field. The colour was so different, and the crop was only about half the bulk of that on the rest of the field.

After having been down in good grass, with plenty wild white clover, for five to seven years, the clay land often yields wonderful crops of grain.

Land that yielded 2½ qrs. oats in 1913 after poor grass yielded 12 qrs. an acre in 1921 after good wild white pasture, and a yaval crop of over 8 qrs. an acre in 1922. This field was, however, a complete failure in turnips in 1923. The

cost of this crop will be shown later when writing of silage. This shows that it should have been bare-fallowed or sown in silage crop. In the former it would have been little trouble, as it was so clean after the two heavy grain crops. It was dirtier after the poor crop of turnips than it was before, and the grain crop in 1924 was also a poor one.

The natural question is, why put the field in turnips? With the land so clean and after heavy grain crops I felt sure it would grow turnips. I had to learn, and certainly felt foolish and poorer. From my previous experience I should have known better.

Having succeeded in getting good grass on clay land the summer feeding is assured, as a good sole on clay land, with



Fig. 12.—Oats. 1921. *After wild white clover pasture in same field as fig. 11.*

abundance of wild white clover, does not burn with drought, as does pasture on light gravelly soils. In my experience I have never known the hay crop or the grass to fail on clay land if reasonably treated. With a good turn to plough down, one is always sure of a reasonably good crop of grain, two crops if it has lain five to six years in grass.

SILOS IN THE '80'S.

Turnips have always been the trouble. In the '80's many silos of a kind were constructed in this district—in fact in many districts in both England and Scotland. There was then a succession of wet seasons. It was almost impossible

to secure hay, and turnips failed repeatedly. Silos were started to save the hay crops, but it is in replacing the expensive turnip crop that the silo has proved of most value.

The silos used then were mostly square or oblong buildings, very often turnip sheds, and the crop was carted in as it came off the field, tramped, and weighted down; but the waste was excessive and the smell appalling, and they soon fell into disuse.

Another cause which contributed to the abandonment of these silos was the prevailing impression that anything was good enough to make into silage, and much useless material was put into silos, and, of course, poor feed was the result. The better the material put in, the better feed you will get out. Most excellent material can always be had on clay soils in beans, peas, and tares, &c. I have never known them to fail to grow a big bulk of green food.

THE WRITER'S FIRST SILO.

I decided to try making this crop into silage for winter feed on the American method, and to stop growing turnips as far as possible. I had seen stave silos of the tower type in Norfolk in 1916 and 1917, but I did not consider them suitable for our exposed climate, and decided to use concrete. I contracted for a silo of this material in 1917, and had it erected early in 1918 at a cost of £300. The size was 16 ft. by 34 ft., and the walls 6 in. thick. The materials used were 60 tons crushed granite and sharp sand, 11 tons best Portland cement, and 30 cwt. steel rods for reinforcing. It was erected in exactly three weeks.

NECESSITY FOR HEIGHT IN SILOS.

After two years' experience of the first silo, I erected a second one, 16 ft. by 44 ft., and with my further experience my only regret is that I did not make both silos 50 ft. or 55 ft. high. It is just as easy to fill a 60-ft. silo as it is to fill one of 30 ft., so far as labour is concerned, and even if only 12 ft. in diameter I strongly recommend 50 ft. or over in height. The waste is much less and the capacity much greater in proportion, owing to the increased pressure. Silos are now fairly common. I believe there are well on to a hundred in Scotland, mostly of concrete, although there is a number of wooden ones and a few of steel. I need not therefore enter into a detailed description of a modern silo, as they can now readily be seen in so many districts.

A large number are in contemplation for this year, and 1

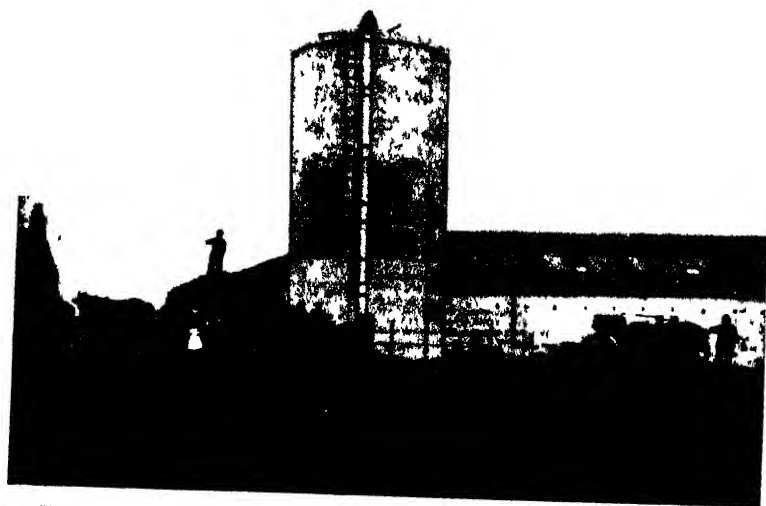


Fig. 13.—*First concrete tower silo in the north, 16' × 34'. Erected March 1918 at a total cost of £300.*



Fig. 14.—*Second silo erected at Cruden Bay, 1921 16' × 44'.*

am quite satisfied they will soon be in very general use, not only on clay farms but on good turnip-growing farms. An Aberdeen firm has, I believe, erected over sixty concrete silos in Scotland, England, Wales, and Ireland.

The only drawbacks that I know of to the use of the tower silo are the cost and the fact that it is not an improvement under Part II. of the Agricultural Holdings Act. That is, a tenant farmer cannot get paid for this improvement without the special consent of his proprietor, but as farmers are rapidly becoming their own proprietors this difficulty tends to disappear.

Stack silage I have seen, but have never been favourably impressed with the result. I have never seen a trench silo, although where the ground is suitable I see no reason why it should not be a success, but it would require very careful attention to avoid waste.

ADVANTAGES OF SILAGE CROPS.

A silage crop has many advantages. On heavy soils, and on moderate-sized farms of medium or even light soils, a silo may be used with profit, particularly if the farm is a dairy one or addicted to finger-and-toe. It is not suggested at present that every farm should have a silo, but the cost of labour is such that, unless on the very best of land, the turnip crop is much too costly.

The early adoption and rapid spread of the tower silo in the States and Canada was due in a great measure to dear labour and the fact that the maize crop so readily adapted itself to the making of silage. We can grow crops of beans, peas, tares, and oats that are of much higher feeding value than maize, and that leave the land much richer than roots do.

The effect of the higher cost of labour in this country since the war is only beginning to be realised now, and farmers who have been going carefully into figures are getting alarmed at the cost of the turnip crop, especially with the risk of a partial failure.

The loss on a 20-acre field of turnips may easily be £200 or more—very possibly more than a year's rent of the farm. The silage crop requires no expensive preparation of the land, and I have never known a mixture such as is used for silage fail to grow a considerable bulk and weight of green food.

There is much to be gained by having part of the turnip break in silage on any moderate sized farm. By having this one gets a much more even distribution of labour. For example, the silage crop can be sown and finished with, so far as cultivation and seeding are concerned, before the ordinary oat seeding begins. Once sown it is finished with,

until it is ready to cut in the end of July or the beginning of August. I am referring to the conditions in Aberdeenshire. Farther south it would be earlier.

18 to 20 acres of silage crop can be put in by two pairs of horses in less than a week on the heaviest of land, whereas the same horses and men might work on half this area for turnips for a month or more. In the Carse of Stirling, I understand, 3 acres of turnips for each pair of horses is about the average that can be properly managed. In one case at least during last summer, where only a part of the turnip break had been sown by July, the other part was sown with



Fig. 15.—*Fourth successive silage crop in same field. 1923.*

a silage mixture. An additional silo was erected and filled with this crop after harvest with excellent results. A spring crop had been sown for the first silo, and this was filled before harvest.

The silage crop gives much more freedom in cropping than turnips. For instance, it can be grown after grass, after grain, after yaval grain, after turnips, or, in fact, after any crop, and successive crops can be grown in the same field. I have done so for four years with excellent results, the last crop being as good as the first, and any difference being due

to weather conditions more than anything else. I may say that in the four years the land was dunged twice.

In lengthening the period between turnips, say, from five years to ten years or more, the turnip crop will invariably be much heavier—certainly a half more—and may possibly be doubled. Another point that might be useful is that where turnips cannot be grown free from disease once in five or six years, after eight years' grass and a single grain crop they can be grown with success for two consecutive years. I have tried this, and both crops were excellent in a field that had previously been notorious for finger-and-toe. The probability is that the same would apply with a silage crop taking the place of turnips in a five or six course rotation, but I have not grown silage long enough to test this.

CUTTING SILAGE CROPS.

The use of silage makes sure that turnip hoeing does not interfere with haymaking, and farmers on stiff land know how often this happens when the turnips are all coming to hoe at once and the hay requiring to be cut. With no turnips to hoe, or only half the usual acreage, the hay can be cut in good time, and when it is ready to stack it can be stacked when the weather is dry. The silage can be put into the silo on the days you cannot work among the hay. You can start working at the silage crop immediately the rain is off. It can be cut and left wilting in the sun for a week, or left in the rain for a week, and not be much the worse. If it is well chopped and tramped hard in the silo when you do get it, it will not hurt. If the weather has been fine and you think it too dry, just lead a small water hose into the eye of the cutter, turn on the tap, and it will make the silage all right. It can hardly be too wet. However wet it is, if you tramp it well it will come out with 70 per cent to 74 per cent moisture, which is just right. Do not let the crop be too ripe or too dry. There are more failures from these two causes than from any other. The crop should be cut just when it is approaching its greatest bulk, and the beans and peas and tares have pods at the bottom and flowers at the top, and the oats in full ear.

Silo filling is done at a time when the horses are not busy. They are out on the grass, and they will not all be required at a time, and can be taken in turn. They will not require any grain, so the horse labour is cheap.

Compare this with working on the turnip land in May and June, when the horses have to be in hard-fed condition. Think of a four-horse grubber in the month of May, pulling through heavy land for a week to get it into condition for

drilling. A deluge of rain comes just when you think you have it in fine trim. You have to wait for a few days, and the whole thing is to do over again.

A turnip crop occupies the land for a whole year. You are not finished with the old ones before you are busy preparing for the next crop. They are an everlasting job from one year's end to the other.

If you have silage or part silage, carting of turnips does not interfere with harvesting or potato-lifting. Silo filling is all past by the middle of August, as a rule, and you can commence feeding silage the day you commence filling your silo, or as soon as there is anything in the silo to feed.

EXPERIENCES OF A LOTHIAN FARMER.

The experience of a Lothian farmer last season is interesting. He erected a large silo, and had a fine crop of the usual mixture. He got his silo filled early in August, and had some crop over. This he fed to seventy big cattle in his courts in the long state. He remarked that "they ate this all right for a few days; they then began to pick out what they liked best in the mixture, and to go about from one trough to another looking for this." There was a lot of waste, and his man was hard-pressed to keep them supplied. He started them on to silage on 1st September, and they ate the silage clean from the first with no waste, and his man had an easy job keeping them supplied. The farmer also remarked: "I think cattle fed on silage are better satisfied than on any other feed I have ever seen. They eat it all, and are not always looking for something better and knocking each other about in an attempt to find it. The cattle rested better, and looked much more contented." He is convinced that it is much more profitable to put the crop through the silo, even for a short time, than to feed it direct from the field in the long state.

I saw the cattle early in December. They were in excellent condition, and practically all fat. They were eating 50 lb. silage, a mere handful of hay, and getting a few pounds of concentrates. The farmer said: "I have not pulled a turnip as yet, and I could not have kept these cattle going on turnips without neglecting something else in the long and tedious grain and potato harvest we had."

SAVING OF CARTAGE IN WET WEATHER.

The equivalent of 400 tons of turnips in the form of silage can be stored in five or six days, and in August weather. A farmer with a 40-acre turnip break, with half of it in silage,

can almost save a pair of horses all winter. I work six horses on the 400 acres I farm. The saving of winter cartage of turnips is very great, and you also save the poaching of the land in wet weather, which is a very important point on clay land.

DISTRIBUTION OF CROPS ON A CLAY FARM.

I have mentioned that a clay farm would always be largely in grass. My 400 acres are divided as follows: pasture, 220 to 260 acres; 40 to 50 acres cut for hay—25 of this is Timothy; 60 to 80 acres grain crop, oats, bere, and wheat; 12 to 14 acres turnips and potatoes; 30 to 34 acres for silage. This carried in summer 180 to 200 cattle, including calves; 80 to 100 Cheviot ewes and their lambs. In winter 150 cattle, the ewes, and 100 feeding sheep, September to January.

Heavy land which would otherwise have to remain in grass can with silage be kept under cultivation. One of my friends remarked: "The silo has changed the value of clay land entirely. Turnips always were the trouble, but silage solves this difficulty." Hard clay land, which has been in grass for over fifty years and which I was afraid to touch in the absence of a silo, I have since ploughed, taken silage crops, sown with wheat, and renewed the grass without difficulty, and with excellent results.

SILAGE AS A CLEANING CROP.

A question which has often been put to me is: "What about the cleaning of the land?" There is no difficulty about this, as I find by growing successive crops of silage the land soon gets clean. The crop of beans, tares, peas, and oats smother all the weeds, and the crop is cut before they get a chance of seeding. You soon get into such a quantity of dung that you can grow crops to smother anything in the shape of weeds. The increased quantity of dung is one of the features of the use of silage. A 10-ton crop of silage will give 2 to 2½ tons dry matter, while a 20-ton crop of turnips will only give 1½ tons of dry matter.

Another very effective help in keeping the land clean is to sow 16 to 18 lb. of Italian rye-grass along with your silage crop, and this produces an excellent bite for sheep in autumn, keeps down surface weeds, and also makes a fine green surface to plough under. The alternative method is to bastard fallow after the silage is cut, and sow wheat in September or October. I do just about half each way. A short rotation which I have found to work well is to sow 20 lb. Italian rye-grass and 6 lb. red clover on the wheat in April, take a hay

crop the following year, dung in the autumn, plough and follow with silage for one or two years as convenient. Mr William M. Findlay, Aberdeen, says ordinary perennial gives quite as good results, and I mean to try this.

SILAGE RELISHED BY STOCK.

There is not the slightest difficulty in getting cattle to eat silage, and they will do equally as well as on turnips, and will not consume nearly so much fodder, neither will they require so much litter. If two-year-old cattle get 40 to 50 lb. good silage and a little hay or good oat straw, they will do just as well as on pasture. They will eat a third to a half less fodder than with turnips, and will be much more contented, and if in courts or yards will be much drier underfoot, and much less likely to go off their legs. Cattle on silage always look contented and well-filled. Irish cattle that have never seen turnips, and are sometimes rather slow to start on turnips, will fill themselves at once with silage.

Undoubtedly more cattle can be kept on an acre of good silage than on a 20-ton crop of turnips. On poor turnip (clay) land the winter stock can certainly be doubled. All the silo users I have questioned are satisfied that they are keeping at least a third more stock at no increase of cost.

PREPARATION OF THE LAND FOR SILAGE CROPS.

These are some of the advantages of silage over turnips. Now I may say something about the preparation of the land and the seeding of a silage crop.

If the silage crop is to follow a grain crop, I dung the stubbles 15 to 20 tons on the surface, and plough down in the usual way with a good heavy furrow and into fairly narrow rigs, 12 ft. to 18 ft., according to the land, and well ridged up in the middle just as if preparing for turnips. In the spring, any time after the middle of February, I sow the beans broadcast on the frosty furrow, and either disc-harrow them in or plough them in with a light furrow. They seem to grow well either way. A fortnight or three weeks later, according to weather conditions and the season, the peas, tares, and oats should be sown and harrowed in; and if the land is not to be ploughed for wheat immediately after the silage crop is off, 15 to 18 lb. Italian rye-grass, sown as the harrowing is being finished, will give some excellent pasture in autumn.

If the beans are not sown by the end of March, it is good practice to sow all the mixture together, and it will do quite well.

SEED MIXTURES FOR SILAGE CROPS.

In the North of Scotland, at least, these are the only crops that are much use, and we are restricted to spring-sown crops. Occasionally an autumn-sown crop of tares and wheat or rye would do all right, but neither wheat nor rye make good silage. In the Border districts and farther south autumn-sown crops are often the best. I have seen sunflowers and maize grown for silage, but I do not think they are equal in feeding value to our mixture of beans, peas, tares and oats, &c.

A seed mixture which has become more or less a standard one with me is—

3 bushels beans, $\frac{1}{2}$ bushel peas,
 $\frac{1}{2}$ bushel tares, 2 bushels sandy oats.

This is a pretty safe mixture on a variety of soils, provided the soil has no hard pan, in which case beans will not grow. Peas, tares, and oats would then have to be relied on, the quantities being increased proportionately.

The mixture can be varied according to the particular type of soil. On very heavy clay I increase the beans and decrease the oats. This mixture makes very suitable silage for cattle. For sheep the beans and peas might be increased and the oats left out altogether. Sheep are specially fond of beans in silage, provided it is cut early enough. They are apt to leave the oats. They certainly will if the oats have been allowed to get too ripe.

Any one contemplating building a silo should experiment by sowing plots of various mixtures to find out what best suits the particular conditions. No two fields are alike, far less any two farms.

On gravelly soil at Scatwell in Ross-shire, in 1923, the standard mixture referred to gave a crop of 9 tons per acre, while a mixture with fewer beans and vetches and more oats yielded nearly 2 tons less.

MANURES TO USE.

The most profitable manures to use are phosphates—4 to 6 cwt. basic slag, ground mineral phosphate or superphosphate, or a mixture of these, and 1 cwt. sulphate of ammonia or other nitrogenous manure, if considered advisable. If the application of dung has been liberal, this may not be necessary. Potash, in my own case, I have found to have no apparent effect whatever.

Compare the working and seeding of a silage crop with preparing the land and putting in of a turnip crop. On

heavy land you have harrowing, second ploughing, harrowing, cultivating or grubbing, harrowing again (possibly all the operations to do twice over if caught by wet), gathering weeds, drilling, splitting the drills, sowing, shimming or running between the drills, hoeing and shimming again, to find some morning before you are up the crows have pulled half the plants, and it is too late to sow a second time. Then there is storing in autumn to provide against bad weather, carting again to the sheds, and cleaning in spring when they begin to develop white roots.

Another time you have a specially good turnip year, like the potatoes in 1923, when half the turnips can hardly be consumed, and when they have to be let for sheep at a give-away price. Do flockmasters ever pay the economic cost of turnips to consume by sheep? Silage can be kept over from one year to another without being a bit the worse.

Quoting my Lothian friend again, writing on 1st January 1925: "If an acre of silage is nearly equal to an acre of turnips (and my opinion is that it is quite equal), then it is well worth the expense of changing over when one considers the other advantages—such as getting through with your work, saving of labour, and not wasting land for the following crop. I have got all my turnips off and the land ploughed." Recollect he hadn't a turnip eaten or pulled on 1st December.

FILLING THE SILO.

The cutting of the silage crop, as explained before, should be done on the early side, and before the stems have begun to waste at the bottom.

Cutting can best be done by an ordinary hay mower or side-delivery reaper. I prefer the latter, as it leaves the crop in bunches, and if wet these may weigh 60 to 65 lb. Some farmers cut with a binder, but if so the crop must be light.

If cutting and filling go on at the same time, it takes ten men and five horses to work a heavy crop, distributed as follows:—

One man and two horses in the field cutting with mower or side-delivery reaper.

Three men and three horses with carts, hay-bogies, or lorries carting in the crop. The men with carts fork off carts into cutter.

Two men forking on to carts in the field.

One man attending hired tractor or steam-engine.

One man feeding cutter and blower.

Two men inside silo distributing and tramping the silage.

If the field is any distance away, another man, horse, and cart or lorry would be necessary. With fewer men and horses—you may cut one part of the day and cart in and fill the other part of the day, or cut and fill on alternate days. The latter is an excellent plan. If you fill continuously for three days, it is best to leave the silage to heat and settle for three or four days. In this way the silo will hold more. The highest temperature I have observed was 137° F., but often it does not nearly reach this. On the other hand, if you have plenty space and height in your silo, you can go ahead day after day until finished. This is the practice in the States and Canada, where an outfit goes from one farm to another filling silos.

One of the best methods of cutting and filling I have come across was adopted by one of my friends in the Carse of Gowrie last season, 1924. He cut his crop (the beans were 7 ft. high) with a side-delivery reaper, and used three hay-bogies with two horses in each for carting in. They slipped the load off the bogies alongside the silage-cutter, so that it could be forked into the cutter in the same way as it was put on the bogies. This is important, as if it is tipped off a cart on to the ground it gets twisted up, and is very difficult to handle. In this way he put seventy to eighty big loads a day through his 16-in. cutter.

The actual chaffing and blowing into the silo is done by a cutter and blower driven by a tractor or any convenient power. For our big crops of beans, tares, &c., the cutter should have a 15-in. to 16-in. mouth. So far these have been mostly of American make. They will readily cut and blow 8 to 10 tons an hour if it is regularly fed into them.

If the silage crop is cut a day ahead and wilted in the sun, so much the better, as some of the excess moisture evaporates, without in any way decreasing the feeding value. This rarely works in practice for more than the first day or two. Silo filling is such a convenient source of work on days when nothing else can be done that you soon make up on the reaper, and go ahead, wet or dry, providing it is not actually pouring and your men can work outside.

IMPORTANCE OF EFFICIENT TRAMPING.

It is very important to have the silage carefully spread and tramped inside the silo, particularly round the sides and near the doorways. If the doorways are not very tight, a strip of tarred paper or felt behind them will prevent air getting in and save waste. It is well to finish filling on the top with something pretty close and green or wet. Some second-cut rye-grass or clover or soft grass does well.

Careful and persistent tramping round the sides for a few minutes every day for a fortnight prevents the silage drawing away from the sides and letting the air down. So far as the air gets down there will be a ring of waste 6 to 9 in. thick, and this may be 3 or 4 ft. in depth. With care there should be only about 9 in. of waste on top and about other 6 in. round the sides.

If the crop by any chance gets rather dry, have no hesitation in turning a water-hose into the eye of the blower. There



Fig. 16.—*Silage crop, Cruden Bay, 1924. This field was in silage crop in 1920, wheat with seeds sown, 1921, and cut for hay in both 1922 and 1923.*

can never be serious loss through too much moisture. It may easily be too dry or too ripe, in which case there is sure to be musty bad silage.

LOSS BY PERCOLATION.

If the crop has been cut green, there will be a large amount of liquid percolating through the doorways. So far I do not see how this can be avoided. It looks like a serious waste, but probably is not more than in making hay or storing roots.

The liquid, weight for weight, has just about the same feeding value as turnips—9 food units,—and may, if the crop has been put in wet, amount to nearly 15 per cent of the total weight. Over 6000 gallons ran off my 16 ft. by 44 ft. silo in 1923. I have always had the best silage when most liquid ran off. This liquid must not be allowed to run into a troutling stream without being filtered through sand, as it contains a good deal of ammonia, and sets up an objectionable fungus growth in the bed of the stream. If possible, let it run on to the surface of a grass field. The cattle drink it readily so long as it is sweet.

Full particulars of the composition of the liquid will be found in an article by Mr Godden, F.I.C., Rowett Institute, in the 'Journal of Agricultural Science' for October 1923.

As Dr Tocher has given analyses of samples of silage in the 'Transactions' for 1923 and 1924, it is unnecessary for me to give these here.

Roughly, the feeding value of good silage is double the feeding value of good turnips, weight for weight. At the Rowett Institute, Aberdeen, 1922-23, 30 lb. silage against 70 lb. turnips fed to dairy cows left a margin of 30 gallons milk in favour of silage over a period of 250 days.

E. I. Sheehy and D. Delany, at the Agricultural Station, Authenry (Irish Free State), after careful experiments extending over two years (1922-23, 1923-24), to test the relative values of silage and mangels, estimated that 5½ lb. of silage was equivalent in food value for milch cows to 10 lb. of mangels. See 'Journal, Department of Land and Agriculture, Ireland,' Vol. xxiv., No. 2, August 1924.

Professor Drew, at the Albert Agricultural College Farm, Glasnevin, Dublin, experimenting over the same period, came to the conclusion that, for cows and fattening bullocks, 10 lb. of mangels were rather better than 6 lb. of silage. See Journal referred to above, Vol. xxiv., No. 3, November 1924.

Mr Arthur Amos, School of Agriculture, Cambridge, and Mr A. M. Oldershaw, Agricultural Organiser for East Suffolk, have done much to popularise silage in England by their instructive articles in the 'Journal of the Ministry of Agriculture.' These articles should be read by all interested in silage.

A good deal has been written about the different qualities of silage—sweet and sour. In my experience it is immaterial whether it is the one or the other; stock eat it with equal readiness, and the feeding value seems the same. The average silage, made from the mixture already referred to, will have a dark amber colour, with a pleasant acid flavour when sucked in the mouth. Very clovery rye-grass hay makes excellent silage. Laid patches of oats or barley, and very grassy bits about gateways and endrigs, can be profitably used in this

way. Aftermath or second crop, mostly red clover, does not as a rule make good silage. It is too soft and sloppy, and can be more profitably consumed in the field.

POSITION OF SILO.

Silos should discharge near or into the feeding-shed, but should not discharge into a dairy byre. They should be accessible to a cart for convenience in carting out to sheep or to other buildings.

FEEDING OF SILAGE.

Silage is the simplest and most convenient of stock feeds to handle. All stock, including calves that have never seen it before, take it at once.

Young stock, even weaned calves, will take 20 lb. for a start, fed at three times. Older cattle will take 30 to 40 lb., and large bullocks up to 50 lb., and cows up to 60 lb., although a moderate quantity is probably most economic. If cattle get all the silage they will eat they will take very little fodder, either hay or straw. Sheep will take 4 to 6 lb. silage a day.

A fairly safe rule for cattle and sheep is to feed about 1 lb. per 100 lb. live-weight—cows rather more. ●

Pigs do well on a few pounds daily, especially if the silage is from beans and vetches. 10 to 20 lb. daily is excellent for young horses running out in winter.

It is all-important in feeding silage to have water accessible to the stock at all times—by troughs if the cattle are in yards, or by water-bowls if they are tied in stalls. In the case of dairy cattle this is a great source of profit, and I have no doubt it is so in the case of feeding cattle as well.

Mr Edwards, late of Aberdeenshire and now in Kent, who milks eighty Shorthorn crosses, mostly heifers, wrote in January 1921 that when he put his cows on silage and installed drinking-bowls, he got an average of 20 gallons more milk daily.

(One East Lothian farmer has wintered 1000 half-bred ewes and several hundred ewe hoggs entirely on silage for several years with marked success, and has reduced his turnip break by three-fourths.

In emptying the silo it is necessary to take off a couple of inches every day or second day, so as to have the silage always sweet. It moulds very readily on contact with air. As the level of the silage wears down, the inside walls of the silo should be carefully cleaned down and lime-washed. The lime keeps everything sweet and clean; and it is very inconvenient to reach the top of the walls when the silo is empty.

Where a certain acreage of turnips is grown along with silage, the two can be fed together with great advantage—say, silage twice and turnips once, or *vice versa*.

Meals are more convenient to feed with silage than cakes, as the meal can be mixed with the silage and fed at the same time. If cakes are fed, they should be fed separately.

For young stock I have found a satisfactory mixture to be—

4 parts ground oats	} 2 to 3 lb. a day.
1 part ground linseed	

Or

2 parts ground oats	} 2 to 3 lb. a day.
1 part dec. cotton-seed meal	

Or

3 parts ground oats	} 2 to 3 lb. a day.
1 part fish meal	

For feeding cattle—

2 parts ground oats	} 3 to 6 lb. a day.
2 parts flaked or ground maize	
2 parts linseed cake meal or earth-nut meal	

COSTS.

Now I propose to say something on the debatable question of costs. I have made out a statement of actual operations and costs, with the results, of growing turnips and silage crops on my own farm in 1923.

I got two well-known farmers in Aberdeenshire, farming recognised good turnip farms, to make out details of operations and costs of growing turnips, with results. Unknown to each other, they arrived at almost exactly the same costs. I think, however, they both put the figures for the various operations too low.

I also got a Carse of Stirling farmer to give me a note of his operations and costs, and I think they were all surprised at the cost of their turnips.

Opinions may differ as to the prices charged for the various operations necessary in producing the crops, but these at least form a basis to work on.

In the case of both turnip and silage the whole costs are charged to the one crop. The land is, however, undoubtedly left in a richer condition after the silage crop than after turnips.

AEDMACHRON, CREUDEN BAY.

COST OF GROWING AN ACRE OF SILAGE, 1923.

ACTUAL OPERATIONS AND RESULTS.

Rent of land	£0 10 0		
Taxes	0 1 0		
Twenty loads dung put on stubble			
in autumn	£4 0 0		
Carting dung	1 0 0		
		5 0 0	
Spreading dung	0 2 6		
Ploughing stubble	1 0 0		
2 men half-hour sowing beans	0 0 10		
Double disc harrowing	0 10 0		
Sowing artificial manure	0 1 6		
Sowing beans, tares, and oats	0 1 0		
1 man, 1 pair horses harrowing	0 2 6		
1 man, 1 pair horses with heavy roller	0 2 6		
		£7 11 10	
Cost of seed—			
3 bushels beans @ 8s.	£1 4 0		
½ „ peas @ 8s.	0 4 0		
½ „ tares @ 15s.	0 7 6		
2 „ oats @ 3s. 9d.	0 7 6		
		£2 3 0	
			2 3 0
Artificial manures—			
4 cwt. ground mineral phosphates			
@ 3s. 6d.	£0 14 0		
1 cwt. sulphate of ammonia @ 17s.	0 17 0		
		£1 11 0	
			1 11 0
Cost of reaping, carting, cutting, blowing and tramping into silo.			
Details of actual work on 18 acres silage crop, estimated at 12 tons per acre.			
Fordson tractor, running cutter and blower, 55 hours, including 1 man @ 3s. 6d. per hour	£9 12 6		
1 man and 2 horses in mower, 55 hours @ 1s. 9d. per hour	4 16 3		
3 men and 3 horses carting, 55 hours @ 3s. 9d. per hour	10 6 3		
6 men loading, feeding, &c., 55 hours @ 4s. 6d. per hour	12 7 6		
Total for 18 acres	£37 2 6		
Per acre	£2 1 3		
		2 1 3	
		£13 7 1	

£13, 7s. 1d. per acre for a 12-ton crop	£1	2	3	per ton
Interest on silo and cutter on, say, 200 tons	0	2	0	
	£1	4	3	per ton

As good silage, weight for weight, is double the value of turnips, this is equivalent to 12s. 1d. per ton as compared with 15s. per ton for turnips on the best turnip farms, and 60s. per ton on my own clay farm and over 10s. per ton on a Carse of Stirling farm.

COST OF SILAGE CROP AT THE MOOR, PRESTEIGNE,
RADNORSHIRE, 1923.

Rent of land $4\frac{1}{2}$ acres @ 30s.				£6	15	0
Interest on capital 5 per cent on £220				11	0	0
Labour						
Ploughing oat stubble per acre	£1	0	0			
Harrowing (2 horses) „ „	0	3	0			
Rolling („) „ „	0	3	0			
Drilling „ „	0	3	0			
Harrowing „ „	0	3	0			
	$4\frac{1}{2}$ acres @	£1	12	0	7	4 0
Seed --						
1 bushel beans @ 8s.		0	8	0		
1 bushel winter oats		0	5	3		
1 bushel winter tares		1	5	0		
$\frac{1}{4}$ bushel peas @ 10s.		0	7	6		
$\frac{1}{4}$ bushel rye @ 9s.		0	6	9		
	$4\frac{1}{2}$ acres @	£2	12	0	11	16 3
Manure -						
5 cwt. superphosphate @ 86s. 8d.		1	1	8		
1 cwt. sulphate potash @ 11s.		0	11	0		
	$4\frac{1}{2}$ acres @	£1	12	8	7	7 0
Labour filling silo						
7 men, 58 hours @ 9d. per hour		15	4	6		
2 men, engine, and blower		19	10	0		
3 horses, 58 hours @ 9d. per hour		6	10	6		
					41	5 0
					£85	7 3

Estimated weight of silage 75 tons— $16\frac{2}{3}$ tons per acre.
Cost per ton, £1, 2s. 9d.

ARDMACHRON, CRUDEN BAY.

COST PER ACRE OF GROWING TURNIPS ON CLAY
LAND, 1923.

ACTUAL OPERATIONS AND RESULTS.

Rent of land	£0 10 0
Parish and county rates	0 1 0
Ploughing stubble	1 0 0
Disc harrowing twice	0 10 0
Rolling	0 3 0
Cross ploughing	1 0 0
Rolling and drag harrowing	0 15 0
Harrowing and rolling	0 10 0
Setting up drills—i.e., drilling	0 6 0
Rolling and shimming down drills after wet	0 10 0
Setting up drills (second time)	0 10 0
Twenty loads farmyard manure	4 0 0
Carting out farmyard manure	1 0 0
Breaking dung in drills	0 5 0
Artificial manure—	
7 cwt. ground mineral phosphates	1 4 6
1 cwt. sulphate of ammonia	0 17 0
Sowing manure	0 2 0
Rolling down drills	0 3 0
Closing drills	0 6 0
Rolling and shimming down drills after wet	0 10 0
Setting up drills (second time)	0 6 0
Drill rolling	0 3 0
Sowing seed	0 2 0
Cost of seed	0 3 0
Hoeing	1 2 6
" (second time)	0 6 0
Two shimmings and one furrowing up	0 9 0
Pulling and tailing	0 15 0
Carting about 6 tons per acre	0 15 0
	£18 0 0

Estimated cost 6 tons per acre, £18.

Estimated cost per ton, 60s.

COST OF PUTTING IN AND SECURING THE TURNIP CROP
AT OLD CRAIG, UDNY, ABERDEENSHIRE, 1923.

	Men	rees	Acres per day	Cost per acre
Rent			—	£1 6 0
Rates			—	0 1 8
Ploughing stubbles, 8½ to 9 in. deep	1	2	4	1 0 0
Harrowing once with tined harrow .	1	2	18	0 0 10
Grubbing	1	4	5	0 4 10
Harrowing twice with tined harrow	1	2	9	0 1 8
Dragging	1	3	5	0 3 11
Harrowing twice with tined harrow	1	2	9	0 1 8
Chain harrowing, if necessary, or rolling	1	2	18	0 0 10
Gathering and carting off weeds, if necessary, drilling with moulding plough	1	2	4	0 3 9
Cost of carting and applying muck 18 loads of 2 3 cubic yards each .	1	1	1	0 10 6
Value of muck, 12 yards (<i>a</i> 7s. . .				4 4 0
Spreading muck in drills	1	1	2	0 3 0
Carting artificial manure to field, 11 cwt.				0 1 0
Sowing phosphates	1	1	10	0 1 0
Sowing nitrogen	1	—	12	0 0 6
Cost of 10 cwt. ground phosphates		—	—	1 10 0
Cost of ½ cwt. sulphate of ammonia or nitrate				0 10 6
Splitting drills	1	2	4	0 3 9
Sowing turnip seed, 1s. 1d.; seed, 4 lb. (<i>a</i> 6d, 2s.		1	10	0 3 1
Shunning once		1	5	0 2 1
Singling			13	0 18 0
Shunning		1	5	0 2 1
Shunning again		1	5	0 2 1
Hand hoeing				0 4 0
Water furring with plough	1	1	5	0 2 1
Pulling and tailing	1		4	1 4 0
Carting home 20 tons	1	2	2·3	1 2 6
				<u>£14 9 4</u>

This looks like 11s. 6d. per ton.

It is assumed that a man costs 6s. per day, and a horse 1s. 6d. Nothing is allowed for wear and tear of tools, which would probably be not less than 10s. per acre, perhaps more. Distance of field from steading has an important bearing on the carting, also speed of operations generally. I have assumed 700 yards to centre of field.

**COST OF GROWING ONE ACRE TURNIPS AT CRICHIE,
INVERURIE, ABERDEENSHIRE, 1923.**

Rent of land	£1	2	0
Rates and taxes	0	1	6
One ploughing	1	0	0
One grubbing, 2½ hours	0	6	3
Dragging	0	3	9
Three harrowings	0	6	0
Chain harrowing and rolling	0	2	0
Gathering weeds, say 3 hours	0	2	6
Carting off weeds	0	2	0
Drilling and filling in	0	10	0
Dung, say 20 loads	4	0	0
Carting out dung	1	0	0
Spreading dung	0	2	3
Manures—			
1 cwt. bone flour	£0	7	0
3 cwt. supers	0	12	0
1 cwt. potash	0	3	0
¾ cwt. sulphate of ammonia	0	12	0
		1	14
Sowing manure	0	2	0
Turnip seed	0	3	0
Sowing turnips	0	2	0
Hoeing	1	2	6
Hoeing (second time)	0	5	0
Three shimmings	0	7	6
Pulling and tailing	1	2	0
Carting 1 acre into shed, say, for crop of 20 tons	1	5	0
	£15	1	3

Cost per ton, say 15s.

**COST OF RAISING AN ACRE OF TURNIPS ON THE CLAY
LAND IN THE CARSE OF STIRLING, 1923.**

17 tons farmyard manure (weighed), put on the stubble land @ 8s. per ton	£6	16	0
Driving out above at 8 loads per day, or, say, two days of man and horse @ 16s. per day	1	12	0
Spreading above, 2 days of man @ 7s. 6d.	0	15	0
Ploughing in dung, 1 acre in 1½ days, or	0	16	0
Spring work—			
First ploughing, 1 acre in 12 hours, say	1	12	0
1 day of 3 pairs of horses harrowing, rolling, and grub- bing to make it ready for second ploughing	3	12	0
Second ploughing, 1 acre in 12 hours, say	1	12	0
1 day of 3 pair as above	3	12	0
Third ploughing, 1 acre in 10 hours, say	1	4	0
1 day of 3 pair as above	3	12	0

Fourth ploughing, 1 acre in 10 hours, say	£1 4 0
1 day of 2 pair as above	2 8 0
Fifth ploughing, 1 acre in 10 hours, say	1 4 0
1 strake of harrows, 1 turn of roller, say	0 4 8
Drilling	0 8 0
Sowing artificial manure	0 3 8
Cost of manure, 7 cwt. @ 7s. per cwt.	2 9 0
Covering drills	0 8 0
Sowing turnips	0 2 0
Turnip seed, 4 lb. @ 1s. 4d.	0 5 4
Drill harrowing	0 4 6
Thinning on clay at 2½d. per 100 yards (contract)	0 14 0
Drill harrowing	0 4 6
Hand cleaning	0 9 0
Carting from field to shed, including any that may be pitted, say 3 days of a man and 2 horses per acre	3 12 0
	<hr/> £40 3 8

Crop about 20 tons per acre.

Rent
Taxes

Where land had been fallowed previous year about 25 tons, in which case there would be two years' rent and taxes to charge.

COMPARISONS.

My own silage crop, as you will see by the figures, works out at £13, 7s. 1d. per acre for a 12-ton crop finished and into the silo ready for feeding, or £1, 2s. 3d. per ton. Adding 2s. per ton for interest on my silo and cutter makes the cost 24s. 3d. per ton.

The cost of the Radnorshire silage crop comes out at 22s. 9d. per ton.

It will be seen that my turnips on Ardmachron cost £18 an acre, and the result was 6 tons per acre of poor quality turnips, or 60s. per ton.

The turnips on Old Craig cost £14, 9s. 4d. for a 20-ton crop, those on Crichtie £15, 1s. 3d. for a 20-ton crop, both practically 15s. per ton.

These costs include rent and taxes.

My Carse of Stirling friend does not seem to have been so fortunate, as his costs, without rent and taxes, amount to £40, 3s. 8d. for a 20-ton crop, or 40s. per ton.

Many farmers may consider 20 tons an acre rather a small crop, but only on the best of land is this weight exceeded in ordinary seasons, and the average turnip crop is very much under this.

Taking silage, weight for weight, as being double the feeding value of turnips, I have, with silage, 12s. 1d. per ton against

the best turnip grower's 15s. per ton, or 40s. per ton in the case of the Carse farmer, and 60s. per ton in my own case on Ardmachron.

The foregoing remarks have been made more from a practical than from a scientific standpoint, and are based mainly on my own short experience. My opinions must not be accepted as infallible. Much has yet to be learned on the subject ; but I am satisfied that a substitute must be found for a large part of the expensive and uncertain root crop, and the making of silage seems to be the most promising method at present.

THE CHOICE OF VARIETIES AND STOCKS OF CROP PLANTS.

By PROFESSOR J. A. SCOTT WATSON, B.Sc., University of Edinburgh.

THE choice of varieties is a matter of perennial concern to the arable farmer. In the nature of the case no selection can be final. Farming conditions change and market requirements change, and under new conditions the old standard sorts may no longer prove the most profitable. Moreover, there is a large and increasing output of new varieties, and from time to time the plant-breeder succeeds in producing something that is definitely superior to what was previously available. To take the oat as an example, the extended use of wild white clover in temporary leys has made it necessary for the farmer to seek for varieties that have less tendency to lodge than those that he formerly grew; the introduction of ensilage has made it necessary to find varieties suited to the production of forage rather than of grain; and, again, many new kinds have been added to our list, some of which excel the older sorts in yield, earliness, or other valuable qualities. Hence the farmer who aims at a high standard of efficiency in his management must be continually on the outlook for information regarding varieties, must endeavour to apply such information to the particular circumstances of his own farm, and must be prepared from time to time to experiment with new sorts. Of the many ways of securing increased returns from the land—better manuring, more thorough cultivation, improved machinery and so forth—there is perhaps none more satisfactory than the introduction of better varieties. The increased return costs next to nothing; the costs of cultivation, manuring, and harvesting remain the same, and practically the whole of the increment can be reckoned as net profit.

WHAT IS A VARIETY?

It is impossible to give any precise definition of what we call a variety, because the term is applied indiscriminately to some five quite distinct kinds of plant groups. It is worth

while to try to explain the difference between these various kinds of varieties, because the matter is of practical interest.

(1) A variety of potatoes is what the botanist calls a "clone"; that is to say, it is a group of plants that are all derived from a single mother plant by a process of division or vegetative reproduction, without recourse to true seed. Thus, in a certain real sense, our fields of Arran Chief potatoes are filled not with separate plants but with separated parts of the one original seedling. Clonal varieties, so long as we continue to multiply them by vegetative methods—*e.g.*, by grafts, cuttings, tubers, &c.,—remain remarkably constant so far as their truly hereditary characteristics are concerned, only rarely and exceptionally producing what are called bud sports. They are, indeed, very liable to "degenerate" or "run-out," but this, it is now fairly certain, is a question of disease and not of breeding. The point is further discussed in the following pages.

(2) Most of our modern varieties of wheat, oats, barley, and beans are what the botanist calls "pure lines." All these species are completely self-fertile and are habitually self-fertilised, so that in course of time the strains become so intensely inbred that they reproduce their characteristics with perfect regularity. Even when a cross is made by the plant breeder, or when a natural cross occurs by chance, the various new combinations of characters very soon sort themselves out again in the true-breeding condition. Hence if we start with the progeny of a single self-fertilised plant we get a group of plants each of which has precisely the same hereditary qualities, and these, barring the accident of a "sport" or an occasional natural cross, are reproduced in a constant condition from generation to generation.

(3) Some of the older varieties of cereals, like "Common" barley and "Sandy" oats, are not single pure lines, but mixtures of several distinct strains. Even in such cases cross fertilisation is so rare that a vast majority of the individual plants belong to definite pure lines and breed true.

(4) As regards turnips, swedes, cabbages, mangels, and beet, the varieties of commerce are in their nature more or less akin to our breeds of live stock. These species are habitually cross fertilised, with the result that they show a more or less marked tendency to variation. It is only by dint of careful and continuous selection that such varieties can be kept up to a high standard of production and reasonably true to type. A particular strain of swedes will deteriorate, if selection be neglected, just as will a herd of Shorthorns or a hirsel of Cheviots, and strains of very different value can be developed from the same original stock. This is quite a different state of affairs from that which obtains when a variety is a pure line. Victory oats form a definite true-breeding type which

cannot be improved by selection and which will not deteriorate (so long as it is kept pure), even if selection be entirely neglected. But in the case of roots the name of the variety may mean comparatively little, while the skill and care bestowed by the seedsman in the selection of his stock always mean a great deal.

(5) When we turn to the clovers and grasses we find that the varieties, if we can still so name the commercial sorts, are of still less definite nature. Most of the agricultural grasses and clovers are almost completely self-sterile, and in any case cross fertilisation is the rule. Moreover, up to the present there are few types that have been subjected to systematic selection of any kind. For the most part the plants have been allowed to reproduce at random, and have gradually adapted themselves, through a process of survival of the fittest, to the soil and climatic conditions under which they have been grown. Thus English and Swedish strains of red clovers are comparatively winter-hardy because the non-hardy types have in course of time been killed out; whereas Italian red clover, not being subjected in its home region to severe winters, is relatively delicate and easily killed by frost. But when we describe a particular strain as non-hardy we apply the description only to the average individual, and we must remember that the strain consists of a complex mixture of types, varying in this as well as in other characteristics. The special feature of varieties of this kind is their power of adapting themselves to changes of circumstances. Each strain contains a great number of alternative characters which are continually being mixed and reshuffled by cross fertilisation, and the average type will change according to the particular combination of qualities that is best fitted to survive.

DEGENERATION OR "RUNNING-OUT," AND "REVERSION."

It is a fact that certain varieties, when cultivated under ordinary farm conditions over a number of years, deteriorate in vigour, yield, &c., and show departures from their original characteristics. These phenomena are due to several distinct causes.

The "running-out" or degeneration of potato varieties is familiar to every farmer. A new variety comes on the market, appears promising, and is brought into general cultivation: it may "degenerate" quickly from the very start, showing a rapidly increasing proportion of weak puny plants with crinkled or curly shaws and small tubers. In other cases the process is slower and less marked, and in still others it is hardly perceptible; indeed stocks of some of the oldest

known varieties have been found which showed no evidence whatever of degeneration. Many theories have from time to time been suggested in order to explain the facts; for example it has been said that continuous vegetative reproduction is "unnatural," and that periodic regeneration from true seed is a necessity of nature. Again, "running-out" has been attributed to the continued use of small tubers as "seed," a practice which has been compared to that of the sheep farmer who sold all his best lambs to the butcher and kept his worst for breeding. And again, degeneration has been attributed to continued cultivation under unsuitable conditions of soil, climate, and the like. All these views contain elements of truth. It is true, for instance, that seedling potatoes often show a condition of greatly restored vigour as compared with their parents, whereas their progeny from tubers show a progressive decline. Again it is known that in certain forms of degeneration the worst-affected plants produce practically nothing but seed-sized tubers, and that these tubers in turn produce degenerate plants. And lastly, it is known that degeneration proceeds much more rapidly in certain districts than in others, as witness the well-recognised value of Scottish as compared with English seed.

But all these facts are incidental to the true explanation, which has now been worked out and confirmed in all essential particulars. The broad fact is that degeneration of potato stocks is mainly due to a group of diseases—mosaic, leaf roll, crinkle, streak, &c.,—which, although differing as to their respective symptoms, have certain features in common. They are all transmitted through the tuber, and usually all the tubers from a diseased mother plant produce diseased plants in turn. They are never, or only very rarely, transmitted through true seed, and hence it is that seedlings derived from a severely "run-out" stock show an apparent improvement in vigour—the fact being that the seedlings are healthy while the mother plants were diseased. Again, seriously affected plants generally produce no tubers that reach the usual "ware" size, and hence if small tubers are continually used as seed there is at least a probability that the proportion of disease in a stock will increase from year to year. Finally, apart from transmission through the tuber, degenerative diseases are spread from plant to plant in the field by greenfly and other leaf-sucking insects; therefore in districts of cool and damp climate, where such insects are rare, degenerative diseases spread slowly, whereas under hot and dry conditions whole stocks soon become so completely infected as to be useless.

The control of these diseases and the maintenance of clean and healthy stocks is a matter of the greatest importance to the potato grower, and particularly to the Scottish grower,

who is so largely dependent on the seed market. It has already been shown that healthy seed can be produced, even in the hottest and driest parts of England, if suitable methods are adopted. These methods comprise the spraying of the crop with insecticides in order to keep greenfly under control; the continued roguing out of diseased plants in order to remove centres of infection; and early lifting in order to minimise the risk of infection of the tubers. It is not intended to suggest that the Scottish seed-potato trade is in immediate danger on this account, because the cost of the measures indicated above may probably be greater than that of obtaining Scottish-grown seed. But it is very necessary that seed growers should maintain a high standard of healthiness in their stocks if they are to retain their market. The growing of stock seed at high elevations, together with the repeated roguing out of unhealthy plants, are the measures necessary to this end.

It cannot be said that the discovery of the degenerative diseases has cleared up the whole question of deterioration of potato stocks. In particular the two types of plant known as the "wilding" and the "bolter," which appear frequently in many varieties, are still unexplained mysteries. Nevertheless the knowledge already available is certain to be of immense value to the industry. Much of this knowledge too may apply, in a general way, to other crops that are reproduced by vegetative methods, for example to the raspberry, where the same difficulty of the "running-out" of stocks is a very serious one.

When we turn to the varieties of cereals, which as noted above are either single pure lines or mixtures of several pure lines, we find again that there is a very prevalent belief in the occurrence of "degeneration" or "reversion." But here the nature of the phenomena is different. In the first place it is certain that real changes of type in cereal varieties are much rarer than has usually been supposed. The bulk of so-called reversion is undoubtedly brought about by nothing more mysterious than mixing with other sorts. The amount of mixing that occurs in seed drills, harvest carts, bags, and particularly in threshing mills, accumulating year by year, is usually very considerable. It is only fully realised when, for example, a black and a white variety of oats are grown on the same farm. Sir R. H. Biffen has recently reported the results of an examination of commercial stocks of his "yeoman" wheat which, in common with other new varieties of cereals, has been blamed for reverting. The examination showed that the vast majority of so-called "reversions" were nothing but "rogues" belonging to other commonly grown varieties of wheat.

It is, of course, possible that in the early days of cereal hybridisation, varieties were put on the market without being

properly fixed ; that is, before they had settled down to the condition of pure lines. But with modern breeding methods and proper care, such accidents should not happen. Again, the occurrence of occasional sports, or of occasional natural crosses, will eventually produce a mixture of types in place of the original pure line. On this account, and because a certain amount of mixing is almost inevitable, cereal varieties require occasional reselection, which is best done by growing a new pure line from a single typical plant. Other methods of selection, such as "rogueing," are much less reliable, and the so-called process of "regeneration" (by crossing two individual plants of the same variety) does not, so far as is known, give any advantages over pure line selection. The broad fact with regard to pure line varieties is this, that with reasonable care and occasional reselection, they can be preserved in the original form, without the slightest degeneration, for an indefinite period of time.

The case of the older varieties of grain is again different. Many of these, such as "Sandy" and "Potato" oats, originated well over a hundred years ago. Many of them were undoubtedly started as pure lines, but in the absence of proper reselection they have become composite sorts, consisting of groups of pure lines which have somewhat different individual characteristics. When subjected to varying conditions of soil, climate, &c., and different methods of seed dressing, it is only natural to suppose that the proportions existing between the several components change, certain of the pure lines increasing at the expense of others. Hence different stocks of potato oats show different average characteristics, and it has now become impossible to say what is the true original type. In such cases it is easy to see how a kind of degeneration might occur. Under poor conditions hardy but perhaps otherwise undesirable types might multiply at the expense of the more valuable pure lines and thus gradually lower the value of the stock as a whole.

In the fourth group of crops—turnips, mangolds, beet, cabbages, &c.—the degeneration of varieties is a real possibility which has to be guarded against. The varieties are not fixed and cannot be trusted to retain their valuable characters unless continuous selection is practised. It is indeed possible that a good deal of further progress in the direction of fixity of type may be achieved. Professor Bateson, for example, has succeeded in producing a non-bolting variety of mangold, thus getting rid of one of the most persistent and troublesome forms of reversion in this species. But complete fixity of type will be very difficult to secure ; it can only be attained by continuous close in-breeding, and apparently this (if it be possible at all) will be difficult to carry out without bringing about a serious loss of vigour in the variety. At the best

it will take many years of laborious work to produce pure line varieties of roots, and in the meantime degeneration of existing varieties can be prevented only by continuous careful selection.

The situation with regard to grasses and clovers is that, in most of the cultivated species, definite and serious deterioration in usefulness has been allowed to occur. This has been due to the almost total neglect of selection, combined with methods of seed growing that have aimed at the lowest possible cost of production without regard to other and more important questions. The cultivated varieties of herbage plants, when compared with the wild indigenous sorts, are for the most part characterised by a tendency to produce a high proportion of stem to leaf; also they are very free seed producers, but notably short-lived. Hence there is now a very general tendency to go back to indigenous strains of grasses and clovers, seed being obtained from old pastures instead of from sown plants. This return to indigenous stocks, while it undoes the harm that has resulted from past mistakes, does not by any means exhaust the possibilities of grass and clover improvement. There still remains great scope in the direction of selecting the best types from among the mixtures of forms that constitute the indigenous strains. This work is also going forward with highly promising results.

To sum up, "degeneration," "reversion," or "running out" may be due to any of several distinct causes. But the conclusion seems justified that it is in no case necessary or inevitable; provided the nature of each particular case be understood, and appropriate measures taken, degeneration can be entirely prevented. This is a point of obvious importance. It is sometimes assumed that varieties, while they are new, have some special endowment of youthful vigour, and that as they grow old they become feeble and worn out with the burden of years. If this were so it would follow that a constant stream of new varieties would have to be produced in order to maintain efficiency in crop production. Actually there is no merit in novelty as such. New varieties, before they are allowed to displace old ones, should be subjected to the test of comparison with true, healthy, and pure stocks of the latter, and proved to be definitely superior.

ACCLIMATISATION AND CHANGE OF SEED.

Closely akin to the problems of degeneration or running-out are those connected with the acclimatisation of varieties and changes of seed. These two phrases express ideas that are precisely opposite to each other. When we speak of acclimatisation we imply that a variety adapts itself to a

new environment and progressively improves in usefulness. When we speak of the necessity of change of seed we assume that under certain conditions a variety degenerates, so that it becomes necessary to secure fresh stock from some other source.

It cannot be said that all the questions arising in this connection have been answered, and the following must be read as a provisional theory rather than as a statement of ascertained fact.

It appears then that the behaviour of a variety in relation to its environment differs according to the nature of the variety. Clones (*e.g.*, potato varieties) and pure lines (the newer varieties of cereals) are fixed as regards their hereditary characters. They cannot therefore in any real sense of the word become acclimatised. On the other hand there are certain conditions that produce, with regard to each species, the best seed, and it will be an advantage for the farmer to secure seed from those areas where the conditions are as nearly as possible ideal. In the case of potatoes, as has been mentioned, the chief factor affecting the value of stocks is the degree of infection with the degenerative diseases. These diseases increase most rapidly under hot and dry conditions where leaf-sucking insects are common, and on stiff or shallow or very dry soils where the plant is liable to suffer checks in its growth. They are most completely suppressed in cool and fairly moist conditions and at high elevations where the carrying insects are rare, and on deep moist vegetable soils where the plant can maintain vigorous growth throughout the season. It is important to note that a mere haphazard shifting about of stocks does no good. Unless the farmer can obtain new stocks from districts where the conditions are definitely better than his own, he will be well advised to retain what he has.

As regards pure line varieties of cereals, the best seed is obtained from crops that have been well grown, well ripened, and well got. Such seed germinates rapidly and evenly, and produces a regular and early crop. Imperfectly matured seed, or such as has never been properly dried, germinates slowly and irregularly, and produces a crop that ripens unevenly and late. Hence we have the general rule that when cereal seed is changed, the new stock should be obtained from an earlier district than that in which it is to be grown. It should be noted that in the case of pure line varieties of cereals the beneficial effect of change of seed is a very temporary one. Changed seed often produces a marked increase the first year, but "once-grown" seed retains very little of the benefit, and twice-grown seed practically none. It may also be pointed out that the best samples of grain for seed are not always those that would be considered best from the commercial

point of view. It has sometimes been found for example that rather thin light samples of oats, grown under dry and warm conditions, have produced more vigorous brairds and better yields than full plump samples grown under moister and duller conditions. In the case of barley, fine brewing samples—plump, thin-skinned, and floury—have sometimes given less satisfactory yields than relatively coarse-grown samples, with higher nitrogen contents, that have been produced on richer land.

When a variety consists of an aggregate of pure lines, acclimatisation comes to have a certain real meaning. It is true that each pure line will breed strictly true to type, but if the proportion of the different constituents changes, the general character of the aggregate will change also. It seems that this may account for the existence of various local strains of the old standard varieties of corn. The strains have become acclimatised to local conditions through the increase of those pure lines that are best fitted to increase and multiply under local conditions. This sort of acclimatisation is a slow process, for generally the differences existing between the various pure lines are of a minor nature and the advantages of any one over its fellows can be only slight. Moreover, the extent to which the character of the variety can change is obviously limited by the extent of the differences that exist among the various constituent lines. Further, the change does not necessarily imply improvement from the farmers' point of view. It may, of course, happen that those types which tend to increase under a given set of conditions are the best commercial types. But it may also happen, especially under poor conditions, that the "survival of the fittest" means the survival of weedy and inferior types which have nothing to recommend them but their hardiness. Even where the change produced is an improvement, it would probably be found that a quicker and greater improvement could be effected by separating the variety into its constituent pure lines, and selecting and multiplying that which was found to be best. This sorting out of pure lines from the commercial stocks of the old standard varieties is a method of improvement that has not as yet been fully exploited in this country.

In general then it may be said that there is little to be hoped for in the way of acclimatising varieties of grain. It is safe to say that if a variety is introduced into a district, and is fairly tried and found wanting in the first few years, there is no reasonable hope that it will later adapt itself to the conditions and succeed.

In the cross-fertilised species (roots, grasses, clovers, &c.) where the varietal characters are not fixed, the case is quite different. Varieties of these species are plastic and adaptable.

and are just as capable of change under natural as under artificial selection. As a rule a variety will become frost-hardy if it be continuously subjected to a frosty climate, because the delicate individuals will be killed off. If it be grown in a dry district it will become drought resistant, because drought resistance will be a condition of survival. In such cases acclimatisation has a real meaning, and should be allowed to play its part in the production, improvement, and maintenance of varieties. The general rule is that selection of stock plants should as far as possible be carried out under the same conditions as those under which the commercial crop will be grown. Thus if a variety of roots is intended to be grown in the North of Scotland it would not be rational to select stock roots from a crop grown in Devonshire. As regards roots there is in fact little ground for complaint with the ordinary methods of selection employed by seedsmen. Probably he sends his stock seed to Lincolnshire or Essex to be multiplied, because in these areas good and regular yields can be obtained and the cost of production thus kept down; but the actual selection of stock plants is carried out elsewhere, and usually under ordinary farm conditions in the locality for which the variety is intended.

With the grasses and clovers there is no analogous process. The bulk of our grass and clover seed is meantime produced without any attempt at selection, and much of it is obtained from foreign countries where the climatic conditions are dissimilar to our own. The result is that our temporary grass land, especially in the less fertile districts, is a good deal less productive than it might be.

QUALITIES DETERMINING THE VALUE OF A VARIETY.

It is impossible, in the existing state of knowledge, to make a complete catalogue of the things which constitute merit in a variety. The capacity to produce a profitable crop under a given set of conditions can be partly stated in terms of power to resist disease, earliness, the "quality" of the produce, and so forth. But to a considerable extent the characteristics which determine productiveness, under a given environment, have been found incapable of analysis, so that cropping capacity can only be determined by empirical tests.

DISEASE RESISTANCE.

One of the factors which may set a limit to the productiveness of a variety is its capacity to resist disease, and hence one of the usual objects of the plant-breeder is to secure a

maximum of natural immunity to any disease that is of serious practical concern. Occasionally, indeed, disease prevention can be accomplished by measures so easy and inexpensive of application as to make the efforts of the plant-breeder unnecessary. Thus, in the case of bunt in wheat, varieties show considerable variation in their power of resistance; but any variety can be kept free by the expenditure of a few pence per acre on seed treatment, and hence natural immunity is a matter of little or no consequence. At the other extreme are diseases like wart of potatoes. In this case no preventive or remedial treatment of any value has been discovered, but, on the other hand, it has been found that there is a great variation in natural resistance, and that many varieties are absolutely immune. Hence British potato raisers are now concentrating on the problem of combining wart immunity with other valuable characteristics. More usually, however, it is found that natural immunity is of a partial nature, and that control measures are either costly or imperfect, so that the farmer must help out the natural power of resistance of his plant by means of appropriate cultural measures. Thus, in the case of blight in potatoes, progress is undoubtedly being made in the direction of control through the raising of more highly resistant sorts, but it is still true for some districts that spraying is of sufficient benefit to leave a profit. Again, the degenerative diseases can be partially controlled by growing seed under the best conditions, but it is an undoubted merit in a variety if it shows a high measure of resistance to these diseases. Potato raisers are therefore now attacking the problem from both aspects—they are endeavouring to produce resistant varieties, and are at the same time taking precautions to prevent the stocks of these sorts from becoming infected. The solution of the problem of finger-and-toe in turnips is to be sought along the same lines. Varieties vary in their power of resistance, and where the disease is likely to occur, resistant varieties should be grown. But additional measures, such as the liming of the soil, cannot meantime be neglected. A measure of resistance to insect and other animal pests can likewise be obtained by selection. Thus varieties of turnips and swedes that make rapid growth in the early stages may survive the attacks of the flea beetle, while other slower-growing types succumb. Similarly, varieties of oats that tiller strongly have a considerable power of recovery from grub attacks, whereas if the tillering habit is ill developed, the power of recovery is small.

STRENGTH OF STRAW.

In the case of grain crops under modern conditions, perhaps the most important of all the factors which set a limit to production is strength of straw. Very often the consideration that makes the farmer hold his hand in manuring is not the cost of the manure or the fear that the crop increment will be insufficient to repay it, but it is the risk of causing his crop to lodge. It is true that something can be done here again by cultural methods—*e.g.*, by the use of carefully-balanced manures, containing ample proportions of phosphates and potash, and by early sowing. But in the main an increase in the yield of cereals is dependent on the breeding of varieties that will stand up under better treatment. Notable progress along these lines has already been made, Yeoman wheat, Plumage-Archer barley, and Record oats being outstanding examples of recently-introduced stiff-strawed sorts.

With wheat and barley the problem of producing non-lodging varieties is comparatively simple, because in neither case is the yield of straw or its quality a matter for much concern. But with oats the yield of straw and its feeding quality are often matters of prime importance, and it is not sufficient to secure a variety that will not lodge if this implies that we are to have a short coarse fibrous type of straw: It would, indeed, be a mistake to suppose that varieties with good feeding straw are necessarily very liable to lodge, or that those varieties which stand well are necessarily deficient from the point of view of the quantity or quality of the straw which they produce. Recent work at Aberystwyth indicates that such is not the case. Nevertheless a high measure of excellence in both respects will be a difficult thing to secure.

EARLINESS.

It is a matter of obvious necessity to choose varieties that can complete their growth and ripen within the limits of the growing season, and it is an additional advantage if ripeness can be attained at an early period in the year, when conditions for harvesting are likely to be good. On the other hand, it is only reasonable to suppose that the productiveness of a variety must be rather closely dependent on the length of its growing period, and it must be admitted that, taking the evidence as a whole, one is rather driven to the conclusion that in general early varieties are low producers, while late sorts are heavy yielders. On the other hand, earliness is by no means a simple phenomenon, and observations of the comparative earliness of different varieties, when made under

different conditions, often give rather strikingly different results. It is fairly certain, in fact, that "earliness" may depend on either of two distinct qualities; on the one hand, we have plants with the habit of passing rapidly through the various stages of growth and of "running to seed" quickly. These types are the earliest under early conditions. On the other hand are types which, although they do not shoot or flower early, have the ability to continue ripening under cold, dull, or wet conditions, when with other varieties the ripening process comes to a standstill. This quality is important in varieties for late districts, and does not appear to have any necessary connection with yield. At all events, it is important to note that observations on earliness made under one set of conditions do not necessarily apply under others.

With cereals, cultural conditions have an important influence on date of ripening. It has already been mentioned that thoroughly-ripened and well-got seeds tend to germinate rapidly and evenly, and so produce an early crop. Thickness of seeding has also quite a pronounced effect. Experiments at Craibstone, for example, have shown that whereas quite large variations in seed rates may be made without any substantial effect on the yield, the seed rate has a marked influence on earliness, the thickest sowings producing the earliest crops.

In the case of oats, recent research at the Aberystwyth Station is tending towards the conclusion that the production of very early varieties for high and late districts is not practicable, because extreme earliness is incompatible with other qualities—such as tillering capacity, hardiness, and straw production—which are generally regarded as essential under the conditions in question. The type of plant that grows rapidly in its early stages, shoots early, and reaches maturity in a short period, is adapted by its nature to hot and dry conditions, and when grown under sunless and cold conditions produces very poor results. In the opposite case a late-maturing variety, when grown under hot and dry (early) conditions, is forced to maturity before it has time to complete normal growth, and so also proves unsatisfactory. At first sight it appears paradoxical to suggest that early varieties are adapted to early conditions, and late varieties to late districts, but there appears to be some fundamental truth in the statement.¹

¹ There is at least a possibility that the problem of corn harvest in the later and wetter districts may be solved along quite other lines than by the breeding of early-ripening varieties. At the moment it appears (even adopting a cautious attitude and bearing in mind all the failures of the past) that an efficient, practicable, and cheap system of artificial drying has at last been devised. If, as seems likely, the drying plant which was perfected at Oxford last year

QUALITY.

Where a commodity is produced for sale, as, for example, wheat or malting barley or potatoes, the farmer has, in the price which his stuff commands, a sufficient measure of the quality of different varieties. New varieties, of course, require a certain time to become known and appreciated, especially where, as in the case of the potato, the judgment rests with the general public; but, broadly speaking, the price realised must be taken as a final decision in respect of quality.

It is a much more difficult problem to form a true opinion in regard to the quality of crops that are grown for stock feeding. In the case of roots there is great variation in the dry-matter content, and it is obvious, if we assume a constant value for dry matter, that a yield of 18 tons per acre, with a dry-matter content of 12 per cent, would be as good as a yield of 24 tons with 9 per cent dry matter. Indeed the lower yield would be preferable, because the other would involve the farmer in the handling and carting of 6 tons per acre of useless water. Arguing on these lines the Danes make their selections of stock roots on the basis of dry-matter content. With the exception of a few of the larger firms, British seedsmen do not follow this plan, but form their judgment on appearance alone. And it must be admitted that the dry-matter content is a rather doubtful measure of feeding value, because a high dry-matter content seems sometimes to be associated with an increase in the proportion of fibre rather than of valuable nutrients. It is even doubtful how far one is justified in drawing conclusions from detailed chemical analyses, giving separate figures for sugar, fibre, albuminoids, &c. At any rate, chemical analyses do not explain the well-known differences in feeding value that exist between roots grown in different districts. It seems that further improvements in the quality of roots must await the results of further research into the question of what constitutes quality. In regard to oat straw the situation is much the same. The feeding value varies greatly from variety to variety, from district to district, and from season to season, and these differences are only very partially ascertainable by present methods of analysis.

should turn out to be a complete commercial success, corn harvest need no longer be a protracted and precarious business; and the high country farmer, apart from all the other obvious advantages that he will gain, will no longer be restricted in his choice of varieties of corn by considerations of earliness.

VARIETY TRIALS.

It may be well to conclude this article with a note on variety trials. It is a matter of manifest importance that the right variety should be selected for any given set of conditions, and it is necessary to consider each new variety that reaches the market in the light of a possible best. Only occasionally is it possible to condemn a variety off-hand ; more usually it has to be subjected to a series of repeated and searching tests before a safe judgment can be formed. A few essential principles underlying the conduct of such trials may be stated :—

(1) Trials must be repeated over a number of years in order that a mean result, applicable to the average season, may be arrived at. If the particular seasons happen to be nearly normal, a three years' average may be regarded as fairly reliable, but if some of the trial years should prove to be highly abnormal, a longer period may be necessary.

(2) No matter how carefully trials may be conducted, they are subject to a certain margin of error ; but the oftener a trial can be replicated, under the same conditions, the more accurate will be the average result. Moreover, a single trial has the disadvantage that there is no indication of the degree of accuracy that has been attained, whereas if the same test is replicated three or four times, the figures obtained, by the amount of variation which they show, provide a measure of the accuracy of the average.

(3) Since most land shows definite variation in fertility from place to place, it is necessary to find some method of measuring the natural productiveness of each plot. This can be done by several methods, perhaps the most satisfactory being that of introducing frequent check plots of a standard variety.

(4) Provided proper precautions be taken, the results obtained from small plots are usually nearly as accurate as from large ones. In any event the average yield of ten plots of one-tenth of an acre each, properly scattered over the experimental ground, is a great deal more accurate than that of a single plot of one acre.

(5) Plots should be long and narrow rather than square, because there is then less chance of soil variation affecting one plot without affecting its neighbours.

As an example of a method embodying these principles the following may be described. It is now in use by the Board of Agriculture for Scotland in its Yield and Maturity Trials of new varieties of potatoes, and, with slight modifications, in cereal and other variety trials at the experimental farm of the East of Scotland College.

The plots used are small, from $1/200$ of an acre to $1/50$ of an acre, and are long and narrow in shape. Every second plot is a check, carrying a standard variety such as Great Scot in the case of potatoes, Victory in the case of oats, or Plumage Archer in the case of barley. Each of the varieties under trial is grown on four separate plots, and in each case the trial plot is placed between two plots of the check variety. The plots are separately weighed, and the yield of each is compared with the yield that might have been expected from the standard variety if that had been grown on the particular plot in question. The four separate comparisons are then averaged, and the probable error of the average is calculated from the figures. For example, in the 1925 trials at Boghall, the yields of grain obtained from four plots of "Potato" oats were respectively 25, 18, 15, and 30 pounds below the average yields of the adjacent plots of "Victory," which was used as a check. The average yield of "Victory" over the whole field was 93 lb. per plot. The average difference was thus 22 lb. in favour of Victory, equal to nearly 24 per cent of the average yield of Victory. The amount of variation in the separate results is such that there is a probability that the true result for the conditions in question is between 21 and 27 per cent in favour of Victory, and that there is a practical certainty that the true difference is not less than 17 per cent nor more than 31 per cent, both in favour of Victory.

There is a need for variety trials, carried out on the lines described above, and conducted in different parts of the country. Obviously a result obtained in one locality cannot be applied with certainty in another where the soil and climatic conditions may be different. But if fairly representative districts were chosen, it seems that results could be obtained that would materially assist the farmer to form an opinion of the merits of new sorts. The state of affairs that has existed in the past cannot be described as satisfactory. It is certain on the one hand that some new varieties have been quite extensively grown which ultimately proved to be inferior to those previously available, and on the other hand it is certain that many farmers have stuck to old standard sorts long after improved new types have become available. As regards potatoes, the Scottish Board is this year conducting a series of Yield and Maturity Trials in four different centres, with five new varieties, all of which gave promising results in preliminary trials last season, and it is hoped to establish a system whereby accurate and full and early information will be made available for each new variety that is placed on the market. A similar scheme might be adopted with advantage for other crops.

SOME CHARACTERS OF SCOTTISH SOILS.

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THE soil is the fundamental material on which all agricultural industry is based. Since the beginning of agricultural science, therefore, it has always been a subject of study. The further our knowledge of it advances, the more we come to realise its great complexity and the difficulty of fully understanding it. From whatever point of view we approach it we find that it is complex. From the mechanical point of view, it is built up of particles of every size and of every shape. From the chemical point of view, we find that it consists of a great variety of substances, inorganic and organic, of very different nature and properties, and that these substances are mixed together in an infinite variety of proportions in different soils. From the biological point of view, we find that it is teeming with life, both visible and invisible, and both vegetable and animal. While much has been learned about the soil from the scientific study which it has received during the past century or more, we cannot but recognise that we have still much to learn, and that fundamental as the soil is, it is very unsafe to dogmatise about it and its properties. The student of science finds that while soil science can be a help and guide to the farmer in many directions, there are still many cases in which science gives little help, and where traditional experience and rule-of-thumb knowledge give quite as safe guidance as anything which science has to teach.

THE OLD VIEW.

The old view, which was held until about fifty years ago, looked upon the soil merely as a mixture of dead chemical particles, most of which were quite inert, and the reactions in the soil were regarded as comparatively simple chemical reactions. At that period the analysis of the soil was of little use to the practical farmer; and although farmers were frequently under the impression that by chemical analyses they could learn everything about the requirements of their soil, and this belief was sometimes encouraged by chemists, the analyses which were made, although they told how much nitrogen, phosphate, potash, lime, and other constituents

were present in the soil, told very little that was a real guide as to the fertility of the soil and as to what it required to improve its fertility. The fatal obstacle was that although the analysts of that period could determine what amount of potash there was in the soil, they could not tell how far that potash was available to crops, or was likely to become available from year to year; nor could they tell whether the soil was otherwise a suitable medium for the growth of crops, so that even if the potash was available the crops would be able to make use of it. At that period sand, clay, chalk, and humus were looked upon as the fundamental constituents of which soils were made up, and sand, clay, and chalk, at any rate, were each looked upon as comparatively simple substances chemically. It was not recognised that much of what is classed as sand may not be simple silica, but may be composed to a considerable extent of complex minerals, and that what is called clay is generally not mere hydrated silicate of alumina, but a complex containing a great many hydrated silicates of variable and by no means simple composition. Till quite recently it was common to find that chalk was spoken of as an essential constituent which was present in every fertile soil, while we now know that in many very fertile soils chalk is absent. It was recognised that humus was a complex substance, but even in the case of humus the popular view was that it was composed of a comparatively small number of substances, the chief of which were the humic acids.

During this period soil reactions were looked upon as comparatively simple and as largely due to double decomposition, in which the soil precipitated and rendered insoluble one constituent which it retained, while it allowed an equivalent quantity of another one to go into solution in the soil water. The decomposition of humus with production of carbon dioxide, and ultimately of ammonia and nitrates, was also looked upon as due to simple chemical action, in which the oxygen of the air played an important part.

SOIL MICRO-ORGANISMS.

The work of the great French chemist, Pasteur, and his school, led to a new light being thrown on the problems of the soil. Pasteur's work led to the recognition of the part played by micro-organisms not only in the causation of disease but in all processes of fermentation, putrefaction, and decay. About fifty years ago it was pointed out by certain French workers that the process called nitrification, by which nitrates are produced in the soil, had the characteristics of a fermentation process produced by micro-organisms. Step by

step from this point it was shown that not only nitrification but all those processes in the soil by which organic matters undergo decay and became humified, whether in the presence or absence of air, were due to the action of micro-organisms. It was also shown, as a result of the labours of many investigators, that through the action of micro-organisms the free nitrogen of the atmosphere is fixed and brought into organic combinations suitable for the use of plants, either by such micro-organisms acting in symbiosis with leguminous plants or living free in the soil and deriving their energy from dead plant materials.

A later development led to the recognition of the important part played by lower animal organisms, the protozoa, in the soil. In the earlier work on micro-organisms it was vegetable organisms like the bacteria and fungi which were studied; it has only been comparatively recently that the importance of microscopic animal organisms in the soil has been recognised.

The advance of soil biology helped to explain many things which were quite obscure over fifty years ago, and led, and is still leading, to very notable advances in soil science. We now recognise that many reactions, which were at one time supposed to be simple chemical reactions, are really conditioned by the presence of living organisms which are everywhere present in the soil, and exist in almost incredible numbers. We have come to learn that the number of species of living invisible organisms present in the soil is very great, and that in every ounce of fertile soil there is a population of hundreds of millions of micro-organisms.

SOIL COLLOIDS.

The next great advance in our knowledge of the soil was due to the application of physical chemistry to its investigation. Forty or fifty years ago the study of organic chemistry was predominant; then came the day of physical chemistry, and for a period about the beginning of the present century this became the predominant study in chemistry. Quite naturally the views of physical chemists, and the advances made in physical chemistry, led to the study of the soil from a new point of view.

The most important of recent advances in soil science has been the recognition of the important part played by colloids in the soil. During the present century the advance of colloid chemistry has thrown most important light upon the reactions which take place in the soil, and the studies which are at present taking place from this point of view are certain to lead to still further advances in the near future. The finest mineral particles in the soil are colloid in character, and the

humus materials of the soil are also colloids. It is now generally believed that the mineral particles of the soil are covered with a colloid layer, and that the reactions which take place in the soil are conditioned by the presence of colloids. This helps us to understand much that has hitherto been obscure in connection with the chemical changes which take place in the soil.

SOIL MINERALS.

By far the greater part of all ordinary soils is composed of mineral matters derived from rocks. It is only exceptional soils which are mainly composed of humus, and most ordinary soils contain less than 10 per cent of their dry weight as organic, or humus, materials, the remaining 90 per cent, or over, being formed of mineral substances. From time to time the mineral composition of the soil has received some study, and recently the Soils Department of the Aberdeen Agricultural School has been making a special study of the mineral composition of Scottish soils, and some results of importance have been obtained.

There are two great groups of methods by which rocks are broken up so as to form soils. The rock minerals may be ground up by merely mechanical means into a more or less finely-powdered condition. Such mechanical means are found in the crushing action of the ice of glaciers and in the rubbing and grinding action of moving water. The other great group of methods by which rock is broken up is based upon chemical action, which not only breaks the rock into a finer mechanical state of division but also decomposes it chemically.

As soon as rock is exposed at the surface of the earth the agencies which break it up begin to act upon it, and in time soil is formed. The oldest soils must therefore have been formed many millions of years ago, when first rock surfaces were exposed on the surface of the earth. In Scotland, however, and no doubt in many other places, practically all the older soils were swept away by the ice-sheet which covered the country during the last glacial epoch. When the ice receded, say, some 10,000 to 20,000 years ago, it left the surface of the country practically covered with debris consisting of rock material which had been crushed and ground to a more or less fine state by the great pressure and slow movement of the ice. From this glacial debris our soils have been formed during the comparatively short period, from a geological point of view, which has elapsed since the ice receded.

The rocks which were then ground up, the debris of which was left behind by the ice, were of two classes: (1) the great masses of crystalline rocks, igneous and metamorphic, of which so large a part of Scotland is formed, and which are

composed of materials which had not previously been subjected to weathering; and (2) sedimentary rocks, which consist of materials which in earlier periods of the earth's history, probably many millions of years ago, had been ground down by mechanical and chemical weathering actions, re-sorted by the action of moving water, deposited in the ocean bed or otherwise, and consolidated into new rocks. Such sedimentary or stratified rocks may or may not be composed of materials which have undergone profound weathering. In the extreme case they are composed of minerals which are the residuals of profound chemical weathering, which has altered the original materials and changed their composition as far as they can be changed by such processes. In other cases they consist of materials which have been formed again into rocks with only comparatively slight chemical alteration of the original minerals. Between these two classes there are to be found all manner of intermediate grades. There is also another class of stratified rock, illustrated by the limestones, which consists of material which was washed out of older rocks in solution during their chemical decomposition, and which has been rebuilt up into new rock from solution, either directly or through the agency of living organisms. All these classes of rock have been ground down again by the ice, and when the ice melted at the end of the glacial period were left as debris covering the surface of the ground, which has become the material from which most of the modern soils of Great Britain have been formed.

SCOTTISH AND ENGLISH ROCKS.

There is a great difference between the rocks which form the great part of Scotland and those found over most of England, and this difference is specially marked between the rocks of the north and west of Scotland and these of central and south-eastern England. As already stated, a great part of Scotland is composed of igneous rocks such as granite, or of metamorphic rocks such as gneiss; the great masses of the central Highlands are practically composed of such rocks. On the other hand, in England, and especially in south-eastern England, the country is entirely composed of stratified rocks. Not only so, but in Scotland, where there are stratified rocks, these are composed to a considerable extent of materials which have undergone only comparatively slight chemical weathering before they were formed again into rocks. On the other hand, most of the formations from which the south-east of England is composed consist of materials which have undergone profound chemical weathering, so that the original materials from which they were derived at some far-off period

of the earth's history have been almost entirely destroyed, except in the case of minerals like quartz, which are able to resist chemical weathering almost permanently.

The glacial debris produced by the grinding up of rocks during the ice age reflects, of course, the composition of the rocks from which it was formed; it practically consisted originally of rock material ground up more or less finely, but not otherwise altered. In Scotland, therefore, such debris consisted largely of the crushed and ground-up remains of igneous and metamorphic rocks, and therefore contained great quantities of undecomposed compound silicates such as are found in the original rocks. Granite, for instance, which is so plentiful amongst the igneous rocks of Scotland, consists essentially of three minerals—quartz, which is practically pure silica, and which is not altered further by chemical weathering, though it may be ground down and rounded by mechanical action; felspar and mica, both of which are compound silicates, containing potash, soda, lime, magnesia, iron oxides, and alumina, combined with the silica. All of the bases named may not be present in any one sample of felspar or mica, but silica and alumina are always present, and we generally find that two or more of the others are combined with them. The ground debris of granite rocks will contain ground felspar and mica, and will therefore contain in combination with silica and alumina greater or smaller proportions of all the bases—potash, soda, lime, magnesia, and iron oxides. Very much the same is true of the metamorphic rocks, such as gneiss, which also occur to such a great extent in Scotland. To a lesser extent the same thing is found in the case of many of the stratified rocks. Large areas in Scotland are covered with Old Red Sandstone, and in this formation, mixed with ground quartz, there are always found considerable quantities of undecomposed compound silicates containing the bases potash, soda, lime, and magnesia.

When we come to some of the strata in the south of Scotland we approach more nearly to English conditions, and find considerable areas of rock composed mainly of the products of profound chemical weathering, and containing few of the original unaltered minerals with the exception of quartz.

SOIL FORMATION FROM ROCK DEBRIS.

As has just been mentioned, minerals like felspar and mica consist of silicates of alumina, combined with other bases such as potash, soda, lime, and magnesia. When these are exposed to chemical weathering they are gradually decomposed, chiefly by the action of water and carbon dioxide.

The potash, soda and lime, and part of the magnesia are gradually removed in solution as carbonates. The iron which is present undergoes a series of changes, which result ultimately, when the weathering takes place near the surface of the earth in the presence of oxygen, in the formation of ferric hydrates. The alumina remains in combination with silica, and the ultimate product, when the weathering has been carried as far as it can go, is the mineral technically known as a hydrated silicate of aluminium, because in it alumina, silica, and water are combined together. This is the material which forms the ultimate basis of clay. On exposure to ordinary weathering reagents—water, air, and carbon dioxide—it undergoes no further chemical change, but it is only in exceptional cases that felspars have been broken down so completely as to form such ultimate clay. Generally the results of the weathering, which are found in the soil, consist of intermediate products from which the potash, soda, lime, and magnesia have been only incompletely removed. There are great numbers of such intermediate products, and to a large extent the crude clay of the soil is composed of such partially weathered materials.

In the south-east of England, where the rocks are largely composed of the products of profound chemical weathering which took place long before the glacial epoch, the debris left behind by the glaciers after the ice melted also consisted of such profoundly weathered materials; thus instead of pieces of ground felspar, such debris would contain materials formed from the more or less complete chemical weathering of felspar, such as ground-up slates, clay-stones, &c. It should, of course, be borne in mind that certain parts of the south of England were not glaciated, and that in such regions the soils have been formed otherwise than from glacial debris.

At the end of the glacial epoch, and in the thousands of years which have passed since then, the materials from which our soils have been formed have been subjected to further actions, both mechanical and chemical. These, however, have not been sufficient to cause profound chemical weathering of the primary minerals found in the igneous and metamorphic rocks of Scotland. This has been shown recently in investigations made at Aberdeen, of which some further account is given below. It is perhaps a little surprising to find that even ten thousand years of weathering has not been sufficient to destroy the small particles of felspar and mica found in the surface soils of Aberdeenshire. The original particles left after the grinding action of the ice were mostly sharp and angular, and it has been found that the particles in Aberdeenshire soils at the present day are also to a large extent sharp and angular.

Though the whole of Scotland was glaciated, all Scottish

soils are not of glacial origin. There are areas where either no deposit was left behind by the ice, or where it was washed away by the subsequent action of water, and where the soils have been formed by local weathering since the glacial epoch. Such sedentary soils, however, are exceptional.

At the end of the glacial epoch when the ice melted a good deal of redistribution of the glacial debris took place through the action of water. During such a period there were no doubt from time to time great floods of water, which carried away much of glacial debris and deposited it as gravels, sands, and silts according to the rate of flow of the water. Ever since the glacial epoch also, the same action has been taking place to a greater or less extent in all the valleys of our rivers and streams, and thus we get many soils in which the glacial debris has been to a greater or less extent sorted out and redeposited from water. At the same time the chemical actions of air, water, and carbon dioxide have been going on, the resultant of all these various agencies being our soils as we find them to-day.

As the felspars and other compound silicates are decomposed chemically a certain amount of material will be washed away in solution, and very fine particles of insoluble material will also be washed from their surface. In solution a certain amount of potash, soda, lime, and magnesia will no doubt be removed, and thus we find in the drainage of Aberdeenshire soils, as shown by the water which flows away from the drain gauges at the Experimental Farm at Craibstone, which have already been described in the 'Transactions,'¹ that soda, lime, magnesia, and potash are found in solution, and, unlike what has been found in any drainage water analysis made in England, the amount of soda in solution in the Craibstone drainage is generally as great as the amount of lime. In drainage at Rothamsted, for instance, the amount of lime in solution always far exceeds all the other bases, but at Craibstone, where in the soils there are large quantities of undecomposed silicates rich in soda, we find in solution in the drainage as much soda as lime.

Whenever there is exceptionally heavy rainfall and water is flowing freely from the Craibstone drain gauges, which are 40 inches in depth, such drainage water is quite opalescent, and contains in suspension a considerable amount of insoluble mineral matter in particles so fine as to be colloid in nature. This matter appears to be the result of the gradual weathering of the compound silicates in the soil, part of which is probably retained in the soil, but a considerable amount of the finest part of which is washed away in the drainage, which it renders opalescent.

¹ 'Transactions of the Highland and Agricultural Society,' vol. xxxiii., pp. 56-79.

COMPOSITION OF MECHANICAL FRACTIONS OF SOIL.

In soils, the materials of which have undergone profound chemical weathering, the coarser particles, which are classed in mechanical analysis as fine gravel, sand, and silt, are chiefly composed of those materials which are stable and practically incapable of undergoing further chemical weathering. The chief of such materials is silica in such forms as quartz and flint, and in soils such as those of the south-east of England (see Table I.) it is found that over 90 per cent of these coarser parts of the soil is generally composed of silica. The remainder is largely composed of alumina and oxides and hydrates of iron. Potash, soda, lime, and magnesia are present in these coarser parts of the soil in small proportion only. Sir Daniel Hall and Sir John Russell analysed separately the chemical fractions of a number of different English soils derived from the Gault, Bargate, Brick Earth, and Clay-with-Flints formations.¹ The average of these analyses, as given by Russell,² is quoted in Table I. :—

TABLE I.—ULTIMATE ANALYSIS OF MECHANICAL FRACTIONS. ENGLISH SOILS. AVERAGE.

	Silica.	Alumina.	Ferric Oxide.	Lime.	Magnesia.	Potash.	Phosphoric Acid.
Fine gravel .	94.4	3.0	2.1	0.4	0.8	0.6	0.06
Coarse sand .	93.9	1.6	1.2	0.4	0.5	0.8	0.05
Fine sand . .	94.0	2.0	1.2	0.4	0.04	1.5	0.02
Silt	89.4	5.1	1.5	0.8	0.3	2.3	0.03
Fine silt { (a)	84.1	7.2	2.6	1.1	0.2	3.2	0.1
{ (b)	64.3	19.3	7.6	2.2	0.4	5.3	0.4
Clay . { (a)	53.2	21.2	13.2	1.6	1.0	4.9	0.4
{ (b)	49.0	29.8	13.1	1.5	1.0	3.4	0.7

It will be seen that the silica in the fine gravel, coarse sand, and fine sand is in every case about 94 per cent, and that alumina and ferric oxide make up most of the rest. In the case of the silt the silica amounts to nearly 90 per cent, and again alumina and ferric oxide make up most of the balance. No percentage of soda is given, but the percentages of lime, magnesia, and potash are in all cases, except in the case of potash in fine sand and silt, below 1 per cent.

¹ 'Journal of Agricultural Science,' 1911, iv., 181-223.

² 'Soil Conditions and Plant Growth,' 1915, p. 54. By Sir E. J. Russell, D.Sc.

were coarse enough to be examined—namely, the fine gravel, coarse sand, fine sand, and silt—compound silicates such as feldspars were practically absent, and that the particles present consisted almost entirely of quartz and oxides of iron. On the other hand, in the Scottish soils derived from igneous rocks considerable percentages of practically fresh compound silicates were found in all the mechanical fractions. The percentages varied very greatly according to the kind of igneous rock from which the soil was derived. Thus in Craibstone soil, which is derived from granite, over 70 per cent of quartz was found, while feldspars constituted from 13·6 to 22·9 per cent of the soil fractions, and heavy compound silicates, together with some oxide of iron, “the ferro-silicate group,” most of the remainder. On the other hand, in soils derived from basic rocks there was little quartz present, the greater part of the soil being composed of small fragments of compound silicates belonging to the feldspar and ferro-silicate groups.

Even in the case of the two Scottish soils derived from Old Red Sandstone which were examined, considerable amounts of compound silicates, including feldspars, were found. In this respect these soils from the Old Red Sandstone occupied an intermediate position between Scottish soils derived from igneous rocks and English soils derived from sedimentary rocks which had undergone profound chemical weathering before the glacial epoch.

The general result of these investigations has been to show that Scottish soils, whether derived from igneous or from metamorphic rocks, or from the sedimentary rock Old Red Sandstone, contain much compound silicate in an unweathered or only slightly weathered condition, and that in those unweathered or partially weathered minerals they contain a great reserve store of valuable bases, such as potash and lime, which are capable of playing a useful part in the soil and adding to its fertility. On the other hand, the soils from south-eastern and central England which were examined, all of which came from well-known Experimental Stations, contained little or no compound silicate in an unweathered state, but consisted almost entirely of the residual products of profound weathering. They do not therefore contain in their gravel, sand, and silt such a reserve store of useful bases as is contained in the Scottish soils. The quartz found in English soils was generally worn and rounded, while in the Scottish soils it consisted, generally speaking, of angular fragments, thus again illustrating the difference in the degree of weathering between the two classes of soils.

THE VALUE OF SOIL INVESTIGATION.

Soil investigation is now attracting a great deal of attention in many other parts of the world as well as in this country. In the United States in particular a large staff of workers is engaged in the study of soil problems. In Scotland the Board of Agriculture has recently approved of the appointment of a special officer for soil investigation by each of the three Agricultural Colleges, and a number of similar officers have been appointed in England. All such soil investigation is not merely theoretical in its object, but, by increasing our knowledge of the soil, is designed to throw light on the difficulties of the farmer, and to place agricultural teachers and county lecturers in a more secure position in advising farmers on problems which arise in connection with the soil and its treatment.

Until quite recently most British soil investigation was made on the soils of the south-east of England, and especially on the soils of Rothamsted and Woburn. So far as Britain is concerned, these have become the text-book soils, and are often looked upon as the types to which all our soils conform. The investigations at Aberdeen have had at least this useful effect, that they have warned us that we must look at soils from a wider point of view, and have indicated that many soils in Scotland (and it is probable that the same is true of England and Wales also) are of a very different type from those of Rothamsted and Woburn.

There are probably in existence all grades of soils, when looked at from the point of view of the degree of weathering to which the mineral constituents have been subjected, from those which are composed of almost fresh and unweathered minerals to those which consist of the residual products of profound weathering. Craibstone soil stands at nearly one end of the scale, and Rothamsted soil very near the other.

Hitherto attention has been almost entirely given to the soils composed of residual products of weathering, and those which contain more or less fresh or incompletely weathered materials have received little or no attention. In fact it has been almost assumed that there is only the one class, that composed of residual materials, to which the names "residual" soil and "mature" soil are sometimes applied, and the other classes of soil composed of fresh or of incompletely weathered minerals, to which the name "immature" soil is sometimes applied, have either been ignored or treated as of little practical importance. The whole of this question requires further consideration, and we can safely say that in

Scotland at any rate the so-called immature soils are by far the more important.

The whole of Britain has been carefully surveyed from a geological point of view, and geological maps for the whole country have been prepared, and are kept up to date by a permanent geological survey staff, who are continually engaged in revising and improving the survey. These maps deal with the solid geology of the country, but a soil survey to deal with the surface deposits which form the soils of the country is equally needed, and is equally important. Preliminary soil surveys have been begun in different parts of the country, and a few districts have been surveyed tentatively, but before much real progress can be made some agreement as to soil classification and nomenclature is needed. In any such classification the mineralogical structure of the soil cannot be neglected. Investigations such as those in progress at Aberdeen are helping to supply the information, which will enable any classification which may be made to recognise mineral structure.

In devising soil nomenclature it is important that the terms adopted should be as simple as possible, and should not be such as to repel ordinary agricultural people, whose assistance is required on the one hand in carrying out soil investigations and survey, and whom on the other hand such work is intended to benefit. There are at present workers in soil science in this country who have favoured the adoption of the nomenclature of the distinguished Russian soil investigator Glinka, and who refer to soil science as "Pedology," and to soils formed from the residues of profound weathering as "Ektodynamomorphic" and to others as "Endodynamomorphic." Such a nomenclature is, to say the least, inadvisable in this country, for it repels the practical man, who cannot understand the terms used, and looks upon them as pedantic and savouring of scientific snobbery. It also alienates the sympathy of those who have the power to further soil investigation through State grants or otherwise. The terminology adopted should be such as will not render the subject more difficult than necessary to ordinary people who are not specialists in science, for this is a branch of science which comes into direct relation with the important industry of agriculture. It is, of course, necessary in certain cases to adopt specific technical terms, but in soil science these should be as few and as simple as possible.

The soils over wide areas in Scotland are thin and light, yet they are surprisingly fertile. They are often somewhat acid and contain no supply of carbonate of lime, yet they are able for long periods to do without lime without suffering from extreme lime hunger. No doubt such soils are benefited by liming, but they do not, like Woburn soil, for instance,

show extreme lime hunger, though they are equally free from carbonate of lime, nor do they respond to liming so readily and immediately. The investigations at Aberdeen are enabling us to understand such peculiarities of Scottish soils, and to explain them. Their great reserves of phosphate, potash, lime, magnesia, and soda, which are present in the form of slightly weathered minerals, do much to account for the surprising fertility of what appear to be poor, light, thin soils, and the great reserves of bases contained in their undecomposed silicates enable them, in the absence of liming, to produce gradually a supply of lime and other bases sufficient to stave off almost indefinitely the evil effects of extreme lime hunger.

The investigations of Scottish soils are yet only in their early stages, and many more workers are required to solve all the many problems of a subject so difficult and complicated yet of such importance to agriculture, and to enable us to make a useful soil survey of Scotland. Just as teams, including workers in different branches of science, have been formed to investigate animal nutrition and animal diseases, so teams, including physical, organic, and mineralogical chemists with geologists and physicists, are required in a fully equipped institute to investigate the ever-important problems of the soil and its fertility. Although much has been done during recent years in Scotland to advance soil study, still more yet remains to be done. The position will not be entirely satisfactory till there is a fully equipped institute for the scientific study of the soil of the country, and attached to it a central staff engaged on a systematic soil survey.

PIG FEEDING.

INDOOR *VERSUS* OUTDOOR FATTENING.

By PRINCIPAL W. G. R. PATERSON, B.Sc., West of Scotland Agricultural College.

IN the report on above subject which appeared in the 'Transactions' for 1923, the Indoor Group of Pigs made very much more rapid progress than the Outdoor Group, and even when the animals in the latter group were housed, their rate of progress was no greater than that of the pigs kept indoors all the time.

The report appeared to arouse a good deal of interest, and was the subject of numerous letters to the leading agricultural papers. The main criticism advanced was that the test was unfair to outdoor feeding, as the pigs experimented with were not from outdoor strains and had not been reared out-of-doors from birth.

This criticism was perfectly legitimate and fully justified; indeed the writer had referred to that aspect of the matter in the report, and had pointed out that the results should be considered as suggestive rather than conclusive, except under conditions similar to those that prevailed. Keeping this aspect of the matter in view, it was resolved to repeat the experiment when opportunity occurred, using pigs bred from what one might call Outdoor Strains.

METHOD OF CONDUCTING THE EXPERIMENT.

In the early summer of 1924 we succeeded in procuring twenty Large White stores from strains known to have been bred and reared out-of-doors for at least five generations. Out of the twenty pigs that were purchased sixteen pigs were drawn and arranged in two groups which were from all points of view as nearly as possible alike.

The average age of the pigs at the time of purchase was approximately twelve weeks, and the average live weight of the animals comprising the groups just over 47 lb.

The live weight at that time in view of the age of the pigs was a little disappointing, but the pigs had been reared on a

cold upland farm in North Ayrshire with only iron shelters, hence progress in the early stages was not likely to be very rapid.

The animals comprising one group of pigs, referred to hereafter as the *Indoor Group*, were housed in two pens, four animals being put in each pen.

The pigs comprising the other group, referred to afterwards as the *Outdoor Group*, were put in a roomy pen opening into a small half-acre field sown with a special forage crop.

The forage consisted of a mixture of rape, vetches, peas, oats, and beans, and the area was divided into three sections, the pigs being moved from section to section fortnightly.

The crop was an exceptionally good one, and from the way it was consumed by the pigs it appeared to be greatly relished.

Although the Outdoor Group of pigs had so much green forage the feeding otherwise was exactly alike. That had been the policy adopted in the previous experiment already referred to, and though there was such a luxuriant crop of forage it was thought better to make no change in the ration of meals fed to the pigs comprising the two groups.

RATION FED.

The meals fed consisted of a mixture of maize meal, fine thirds, barley meal, and fish meal. The proportions of the maize meal and fine thirds were varied during the experiment, in the manner indicated below :—

MEAL MIXTURE (Parts by weight).

	First Period. 6 weeks	Second Period. 6 weeks.	Final Period. 8 weeks.
Maize Meal . . .	2 parts	3 parts	4 parts
Fine Thirds . . .	4 „	3 „	2 „
Barley Meal . . .	3 „	3 „	3 „
Fish Meal . . .	1 „	1 „	1 „

At the commencement of the experiment the animals in both groups received a daily allowance of $1\frac{1}{2}$ lb. of the meal mixture per pig. This was increased by $\frac{1}{4}$ lb. per pig per week throughout the entire feeding period in order to keep pace with live-weight increase, and the allowance during the second week of the experiment was accordingly 2 lb. per pig per day, during the third week $2\frac{1}{4}$ lb., and so on at that rate of increase.

The meals were all fed raw and dry as in previous experiments, but all the pigs received, in addition to the mixed meal, whey at the rate of half a gallon per lb. of meal. The allowance of whey on this basis was seven-eighths of a gallon per pig per day during the first week of the experiment, one gallon during the second, and so on.

DURATION OF THE EXPERIMENT.

The experiment commenced on the 19th June, and continued until the pigs were killed on 6th November, a period of twenty weeks.

The Outdoor Group were not given an outrun all that time, but were housed on the 11th September, after having been on green forage for a period of twelve weeks, by which time the crop was practically all consumed. They were entirely indoors for the last eight weeks of the experiment, and housed in two pens similar to those utilised for the Indoor Group.

The pigs were weighed fortnightly throughout the entire period, and two weighings were also carried out at intervals of one week. The live weights at these periodic weighings for the animals comprising the two groups are given below in Tables I. and II.

TABLE I.—OUTDOOR GROUP.

LIVE WEIGHTS ON THE UNDERNOTED DATES.

Pig No.	June 19th.	July 3rd.	July 10th.	July 24th.	Aug. 7th.	Aug. 21st.	Sept. 4th.	Sept. 11th.	Sept. 25th.	Oct. 9th.	Oct. 23rd.	Nov. 6th.	Live-Weight Increase per Pig.
1.	45	60	65	77	96	108	128	130	142	161	174	207	162
2.	41	51	56	68	79	92	104	112	121	150	160	189	148
3.	47	61	69	82	101	116	140	146	154	189	201	217	170
4.	50	65	76	90	101.	124	146	152	170	203	211	229	179
5.	44	51	59	73	87	110	132	138	150	187	200	217	173
6.	64	77	85	101	117	126	147	156	182	200	209	225	161
7.	43	51	56	67	78	83	97	104	108	120	132	140	97
8.	44	55	61	72	87	103	126	138	158	185	200	220	176
Total	378	471	527	630	746	862	1018	1076	1185	1395	1487	1644	1266
Average live weight	47½	58½	65½	78½	93½	107½	127½	134½	148½	174½	185½	205½	158½

TABLE II.—INDOOR GROUP.

LIVE WEIGHTS ON THE UNDERNOTED DATES.

Pig No.	June 19th.	July 3rd.	July 10th.	July 24th.	Aug. 7th.	Aug. 21st.	Sept. 4th.	Sept. 11th.	Sept. 25th.	Oct. 9th.	Oct. 23rd.	Nov. 6th.	Live-Weight Increase per Pig.
	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.	lb.
1.	40	47	58	65	95	115	138	147	164	195	205	216	176
2.	40	50	60	74	87	100	126	140	162	183	201	217	177
3.	57	67	81	108	125	147	162	190	215	231	241	253	196
4.	41	48	59	66	69	85	110	124	146	165	177	199	158
5.	44	53	62	84	103	111	138	150	163	185	203	211	167
6.	62	75	87	115	130	157	182	204	222	241	258	269	207
7.	52	58	70	93	103	122	150	163	183	202	211	225	173
8.	41	44	49	64	78	86	110	130	142	161	180	195	154
Total	377	442	526	669	790	923	1120	1248	1397	1563	1676	1785	1408
Average live weight	47½	55½	65½	83½	98½	115½	140	156	174½	195½	209½	223½	176

LIVE-WEIGHT INCREASES OBTAINED.

It will be seen from the foregoing tables that the average live-weight increase per pig in the Outdoor Group for the twenty weeks was 158½ lb., and in the case of the Indoor Group 176 lb.

The average weekly live-weight increase for the two groups of pigs over the entire feeding period therefore works out as follows :—

Outdoor Group, 7.9 lb. per pig per week.

Indoor Group, 8.8 lb. per pig per week.

Taking the two separate periods for the Outdoor Group—namely, the twelve weeks with free outrun on green forage and the final indoor feeding period of eight weeks—the average weekly increases for these periods were as follows :—

Twelve weeks free outrun on forage, 7.27 lb. per pig per week.

Eight weeks indoors, 8.87 lb. per pig per week.

This result is all the more striking in view of the fact that no extra feeding was given to replace the green forage from which the pigs were withdrawn.

The corresponding increases for the Indoor Group during these periods were :—

First twelve weeks, 9 lb. per pig per week.

Final eight weeks, 8.4 lb. per pig per week.

An examination of the figures giving the individual rates of progress will show that pig No. 7 in the Outdoor Group made very poor progress, the live-weight increase per week being rather under 5 lb. ; but even if we were to exclude the results for this pig, the Outdoor Group is still materially behind the Indoor Group.

Judging by our experience from experiments carried out at the College, it would appear that in outdoor fattening the percentage of pigs giving disappointing returns is likely to be greater, and this is an aspect of the matter that should not be overlooked. In all probability, if pig No. 7 had been in the Indoor Group progress would have been quite satisfactory.

The pigs were killed on the 6th November, and the live and dead weights for the individual animals comprising the two groups are given in Table III.

TABLE III.—LIVE WEIGHTS AND DEAD WEIGHTS.
OUTDOOR GROUP.

Pig No.	Live Weight.	Dead Weight.	Dead Weight to Live Weight
	lb.	lb.	
1.	207	163	78.7
2.	189	147	77.7
3.	217	167	77.0
4.	229	179	78.1
5.	217	167	77.0
6.	225	176	78.2
7.	140	106	75.7
8.	220	174	79.8
Total	1644	1279	—
Average	205½	159¾	77.8

INDOOR GROUP.

Pig No.	Live Weight.	Dead Weight.	Dead Weight to Live Weight.
	lb.	lb.	%
1.	216	174	80.4
2.	217	171	78.8
3.	253	200	79.0
4.	199	151	75.8
5.	211	168	79.6
6.	269	215	79.9
7.	225	180	80.0
8.	195	153	78.9
Total	1785	1412	—
Average	223½	176½	79.1

It will be observed that the Indoor Group of pigs were 17.6 lb. heavier than those in the Outdoor Group at the end of the experiment, and further, that they also gave a slightly higher percentage of dead weight to live weight than the Outdoor Group—namely, 79.1 per cent as against 77.8 per cent, being a difference of 16.6 lb. in dead weight in favour of the Indoor Group, hence the balance in favour of the indoor feeding is really greater than the difference in live weight would seem to indicate.

The pigs were sold on a dead-weight basis at 93s. 4d. per cwt., or 10d. per lb. "rough," and the sums realised for the animals comprising the two groups worked out as follows:—

Group.	No. of Pigs.	Dead Weight.	Price per lb.	Total Value.
Outdoor .	8	1279 lb.	10d.	£53 5 10
Indoor .	8	1412 lb.	10d.	58 16 8

Leaving out of account for the present the value of the green forage consumed, the balance in favour of the indoor feeding amounts to £5, 10s. 10d. for the group of eight pigs, or 13s. 10d. per pig.

QUALITY OF THE BACON.

White fish meal amounting to 10 per cent of the meal mixture was fed throughout the entire experiment and right up to the time the pigs were killed, as previous experiments had proved conclusively that with genuine white fish meal that amount could be fed with very material benefit and without any detrimental effects at all. It is only when inferior fish meal is used, or when it is fed in excessive amounts, that trouble arises.

The quality of the bacon from both groups of pigs was entirely satisfactory, as the following report from Messrs Turnbull, Bacon Factors, Bridge of Allan, will show:—

"With reference to the two marked lots of pigs that you wish us to report on, we have pleasure in stating that to the best of our knowledge there was, practically speaking, no difference in the quality. Both appeared to be well fed, and the finished article was firm and uniform in quality. Trusting this may be of use to you."

MEAL CONSUMPTION PER LB. LIVE-WEIGHT INCREASE.

As has already been pointed out, the pigs at the commencement of the experiment received $1\frac{1}{2}$ lb. of the mixture

of meals per pig per day, and as this was increased at the rate of $\frac{1}{4}$ lb. each week the allowance of meal per pig per day during the twentieth week—the last week of the experiment—was $6\frac{1}{2}$ lb.

The meal consumption for the twenty weeks on this basis amounted to $577\frac{1}{2}$ lb. per pig, or 4620 lb. for the group of eight pigs.

When we consider the live-weight increase obtained we find the meal consumption per lb. live-weight increase to be as follows :—

Group.	Total Live-Weight Increase.	Amount of Meal consumed.	Meal consumed per lb. live-weight increase.
Outdoor . . .	1266	4620	3.64
Indoor . . .	1408	4620	3.28

These figures show that, even disregarding the value of the half-acre of forage consumed by the Outdoor Group of pigs, the indoor method of feeding is the more profitable one. Further, the conditions under which these results were obtained were practically ideal for the Outdoor Group; that at least was the verdict of many interested visitors during the season.

When we take into account the forage consumed, the superiority of the indoor method is conclusively demonstrated. It was not possible to obtain the exact weight of forage consumed by the pigs, as a certain amount was unavoidably trampled down, but the half-acre produced fully five tons of green forage on a basis of 20 per cent dry matter and 80 per cent water. That represents an extra ton of dry matter for the Outdoor Group of pigs in a period of twelve weeks, and for which absolutely no return was obtained. From the financial point of view, therefore, the outdoor method of feeding proved very much more costly.

In justice to the outdoor method of feeding, it should be pointed out that a reduction in the meal ration for the Outdoor Group might have given equally good live-weight increases, and certainly would have cheapened the feeding for that group of pigs, but that was not the object in view in this particular experiment.

The result obtained in the experiment under review, when taken in conjunction with that of the former experiment already referred to, gives no support to outdoor fattening in the South-West of Scotland even in case of Outdoor Strains of pigs.

RATING AND TAXATION OF AGRICULTURAL SUBJECTS IN SCOTLAND.

By J. H. MILNE HOME, Irvine House, Canonbie.

THE burden of rates and taxes upon the agricultural industry has been a favourite theme of speakers for many years past. The question has been discussed by National and Local Agricultural Societies, by the Farmers' Union, and from time to time on political platforms. An astonishing variety of opinions has been expressed. Sometimes it is stated that the burden of rates and taxes on land is so crushing that it is killing the whole industry and swallowing all profits. Other speakers, usually upon urban platforms, assure their audiences that land is too lightly taxed, and is not carrying its fair share of the national burden. Very often the subject is approached merely from the point of view of the individual speaker or writer, who may quite truthfully set forth his own particular problem, and illustrate where the shoe happens to pinch him. Such statements, however, only show one aspect of a highly complicated and technical problem, and are apt to lose sight of the fact that Parliament and the Government of the day should look at all such questions in the national sense, and endeavour so to spread the heavy burden of taxation, which is a legacy of the war years, that it is equally shared by all classes and all industries.

The incidence of taxation on land in Scotland has in the last few years assumed a new aspect, owing to the large increase in the number of occupying owners. Rates and taxes which were previously divided between the owner and the occupier now often fall wholly on the same individual. A rate of four shillings in the pound does not look so alarming so long as two shillings is paid by the owner and two shillings by the occupier. When, however, the occupier happens to purchase his land, and the owner's and occupier's shares of the rates and taxes are thrown together, the amount demanded by the rate-collecting authority assumes its true proportions.

The tenant who buys his holding has no doubt obtained, during the negotiations for sale, a statement showing the amount of the "owner's burdens," and these burdens deducted from the gross rental give the net rental, upon which a certain

number of years' purchase is taken for the purpose of ascertaining the capital value. These "owner's burdens" do not include income tax, which is leviable upon all incomes above a certain limit. It is very often in connection with income tax that the small owner of land finds his greatest difficulty, and he may, through lack of knowledge, lose the opportunity of recovering part of the tax, repayment of which he is legally entitled to claim. Some notes on the method of assessment and collection of rates and taxes may therefore be of assistance to both owners and occupiers, as well as to the occupying owner. It is with that object in view that this article has been written.

INCOME TAX.

Income tax as now levied is mainly based on the Income Tax Act of 1918, subject to certain amendments made by subsequent Finance Acts. The tax in respect of the ownership of lands and houses is levied under Schedule A, and in respect of the occupation of lands under Schedule B. It is interesting to refer to the figures given in the last Annual Report of the Commissioners of Inland Revenue for the year ending 31st March 1923 (Cmd. 1934), where the gross income and actual income assessable under Schedules A and B in the United Kingdom, and also the actual assessment made on lands in Scotland, are given :—

Year.	GROSS INCOME (United Kingdom).		ACTUAL INCOME (United Kingdom).	
	Income from Ownership of Lands & Houses, &c. (Schedule A.)	Profits from Occupation of Lands, &c. (Schedule B.)	Schedule A.	Schedule B.
1914-15 .	£285,030,302	£17,550,631	£176,953,872	£5,220,442
1915-16 . .	286,185,517	51,490,000	178,172,677	28,917,919
1916-17 . .	287,941,633	51,480,000	184,597,540	28,603,341
1917-18 . .	288,347,505	51,230,000	184,051,891	29,024,104
1918-19 . .	288,699,057	98,800,000	188,151,394	63,460,150
1919-20 . .	290,751,665	98,950,000	188,824,296	64,087,328
1920-21 . .	293,165,974	98,950,000	182,272,355	66,423,671
1921-22 . .	296,691,397	98,950,000	183,158,769	55,977,917
1922-23 . . (estimated)	302,000,000	51,000,000	188,000,000	28,000,000

Taking the figures for the last complete year (1921-22), the Schedule A assessments were :—

	SCOTLAND.	UNITED KINGDOM.
GROSS INCOME (Schedule A) from—		
Lands, &c.	£5,570,000	£51,900,000
Houses, &c.	23,157,603	243,495,097
Other Property	460,000	1,296,300
Total Gross Income	£29,187,603	£296,691,397
<i>Exemptions—</i>		
Incomes below limit, &c.	£2,646,036	£35,387,471
<i>Reductions—</i>		
Repairs, &c., Lands	1,061,815	8,493,475
Do. Houses and Buildings	3,905,397	38,822,674
Empty Property	136,876	2,986,066
Other Reductions and Discharges	5,683,125	27,842,942
	£13,433,249	£113,532,628
ACTUAL INCOME (Gross Income less Deductions allowed)	£15,754,354	£183,158,769

It is probable that the increase of £17,000,000 in gross assessable value of houses and lands (Schedule A) from £285,000,000 to £302,000,000 in nine years was mainly attributable to houses. The increase in actual income during the same period was £12,000,000.

Turning to the particulars of Schedule B, the figures of gross income and actual income are very remarkable. The gross income is conventional in the sense that up to and including 1914-15 the assessment was levied on one-third of the rental of land. For the ensuing three years it was levied on single rent, in the four succeeding years on double rent, reverting again in 1922-23 to single rent. The "actual income" Schedule B shows quite different results. There was a fivefold increase in 1915-16 as compared with the previous year. The "actual income" was again more than doubled in 1918-19 and the two following years, while 1921-22 reflects the sudden fall in farming profits, which corresponded with the fall in the price of agricultural produce.

The figures in the second table show—

1. That the gross income from the ownership of lands in Scotland represents little more than one-tenth of the total for lands in the United Kingdom.
2. The Schedule A assessment on lands in Scotland repre-

- sents 19 per cent of the total, the remainder being mainly houses.
3. The reductions allowed for repairs and maintenance of lands amount to 19.06 per cent in Scotland, and 16.36 per cent for the United Kingdom. The reductions for repairs and maintenance of houses amount to 16.86 per cent in Scotland, and 15.94 per cent in the United Kingdom.
 4. The "actual income" from lands and houses in Scotland is very little more than one-half of the gross income.

In assessing Schedule A income tax on lands, the deductions allowed are—

- (a) One-eighth of the gross rental in respect of repairs and maintenance.
- (b) The amount of the owner's rates, these including County, Parish and Burgh Rates, Land Tax, and Heritors' Assessment. Minister's stipend, surplus teind, and feu-duties are not allowed as deductions, for the reason that income tax is deducted by the owner of the lands when he makes these payments. It is important for the owner to make sure that the owner's rates are really deducted in full on his assessment notice, as it frequently happens that previous year's figures are taken, and an under allowance is made. Moreover, it is difficult for the assessing authorities to know what has been the amount paid in heritors' assessment in the previous year unless they are informed. Empty houses are not liable to assessment for income tax, and should be claimed as deductions.

If the expenditure upon repairs, maintenance, management, and fire insurance for the previous five years exceeds one-eighth of the rental of lands, the owner is entitled to make what is known as a "Maintenance Claim." It has been shown from the figures quoted above that the average cost of maintenance in Scotland is nearer one-fifth than one-eighth, and there are probably few estates or individual farms in the fortunate position of being able to do all necessary repairs on one-eighth of the rental. It follows, therefore, that in the great majority of cases maintenance claims can be made, and they are being lodged in increasing numbers owing to the high rate of the income tax. It is well worth while for the occupying owner to look into his expenditure upon repairs and replacements, and to obtain from the Inspector of Taxes for the district the necessary form upon which to make the claim. It is not always easy for a new owner to obtain a complete

record of expenditure on the farm for the previous five years, but this information should be got from the late owner if at all possible. As soon as a farm is sold, all expenditure upon it must be dropped out of the seller's maintenance claim, even although he may have incurred large outlays in the previous five years. This, on the face of it, seems somewhat unfair. The contention of the Inland Revenue is that the value of this expenditure is presumed to be recovered by the seller in the purchase price of the land. A more cogent argument is that the maintenance claim is really a further allowance in respect of certain subjects which have been assessed to Schedule A Tax, and such allowance cannot be continued to a person when he no longer pays Schedule A Tax in respect of them.

Difficult questions are apt to arise as to what are repairs and replacements, and what are improvements. The erection of new buildings, over and above existing buildings and not in *replacement* of existing buildings, is held to be an "improvement," and is excluded. Such would be the erection of a new hay-shed or byre, or the building of a new cottage if additional to the existing houses. Similarly, tile drainage where none had previously existed would be an "improvement," but tile drainage done to replace existing drains which had ceased to serve their purpose would be allowable. For some time a good deal of doubt existed as to whether the provision of a gravitation water supply in place of a dip well or draw well was an improvement or not. It has now been admitted by the Inland Revenue that such expenditure as may be rendered necessary at the demand of a public health authority, or in anticipation of the requirements of such an authority, may be allowed in maintenance claims. Where any such matters are in doubt, it is best to include the items and invite the Inspector of Taxes to express his views.

Unlet shootings are not liable to Schedule A income tax, although, no doubt, income tax is often paid upon them. Let shootings are assessed at their net letting value—that is, if the owner pays a gamekeeper or incurs other expenses for the shooting tenant, the owner may deduct such wages and expenses from the gross rent receivable when making his return for the Valuation Roll.

Schedule B Tax is much simpler, being based upon single rent without deductions except for the farm cottages. Thus, if a farm rent in the Valuation Roll is £200, and there are three farm cottages entered at £7 each, the sum assessable to Schedule B will be £179. If the occupier can prove at the end of the year that his profit has been less than the sum assessed for, he is at liberty to make a claim for repayment of the tax upon the difference. Moreover, if he can show that an actual loss has been sustained, the loss can be set-off against other income.

Another alternative method of assessment for the occupier of lands is under Schedule D with a three years' average. This method of assessment is not in great favour, and Schedule B is the more general rule. Schedule B on woodlands is charged on one-third of the Valuation Roll rental.

An actual example of how income tax is assessed on an occupying owner whose holding is entered in the Valuation Roll at £100 is given below. It is assumed that there is a cottage on the holding, which appears in the Inhabitant Occupier column of the roll at £5.

SCHEDULE A.

GROSS RENTAL	£100
Deduct for Owner's Rates = 3/- per £	£15 0 0
Do. one-eighth	12 10 0
	<hr/>
Net sum assessable under Schedule A	£72 10 0

SCHEDULE B.

GROSS RENTAL	£100 0 0
Deduct for Cottage	£5 0 0
Do. earned income	
10%	9 10 0
	<hr/>
	14 10 0
	<hr/>
	85 10 0
	<hr/>
	£158 0 0

No account is taken in these figures of the various "personal allowances" made to a single or married man, or for children. In most cases these allowances would be sufficient to cancel the income tax payable in respect of the £100 rent of an owner-occupier if there was no other source of income.

With regard to the assessment of houses for income tax, the allowance for repairs was until a few years ago one-sixth of the gross rental. The allowance has now been varied, and is more liberal, the scale being as follows :—

Not exceeding £40 rental	One-fourth
£40 to £50 inclusive	Ten Pounds.
Exceeding £50 but not exceeding £100	One-fifth.
Exceeding £100—Twenty Pounds, plus one-sixth of the excess over £100.	

When maintenance claims were first allowable, the rental of houses to which they might apply was restricted to a low figure. The rental limit has been gradually extended in recent years, and there is now no limit, so that any dwelling-house, whatever its valuation, may be included in the maintenance claim. "Dwelling-house" includes all stables, motor-house, outhouses, etc. In addition to actual expenditure upon repairs and maintenance, management charges (including

salaries, incidental expenses, and auditor's fees), the cost of drawing leases, and fire insurance are items which may be included.

LAND TAX.

The Land Tax is one of the oldest methods of raising revenue. Originally a certain sum was levied upon each county and burgh, these being made answerable for the collection of the quota assigned to them. At the date of the union of the kingdoms, early in the eighteenth century, the Land Tax had become practically fixed, and was levied annually instead of at irregular intervals. The Act of Union provided that whenever £1,997,763 was raised in England, £48,000 should be raised in Scotland. These figures are interesting as showing the probable relative wealth of the two countries at that time. The Scottish quota was barely $2\frac{1}{4}$ per cent of the English quota. In 1798 legislation provided for the redemption of Land Tax in the option of the taxpayer, the intention being to utilise the monies so received for paying off part of the National Debt. For many years the Land Tax was collected quarterly, then half-yearly, and thereafter annually. Redemption of Land Tax has not been extensive in Scotland, and the present sum collected is about £32,000 per annum. The incidence of the tax is somewhat uneven, some lands being entirely free through redemption, others carrying a rate varying from 1d. to 4d. per £ on current rental. The tax may not exceed 1s. per £ of rental, and it is only in exceptional cases that the Land Tax approaches that figure in Scotland. On the sale of a farm, or an area of land of any size, it is customary to allocate the Land Tax according to the rate payable for the parish or estate. When so allocated and agreed upon between seller and purchaser, and adjusted with the Inland Revenue, the amount remains fixed, and is paid annually to the Collector of Taxes in the same way as the income tax.

It is important for the small owner of land to note that if he can produce to the Collector a certificate from the Inspector of Taxes that he has been allowed exemption from income tax on the ground that his income is below the statutory limit, no Land Tax will be collected. This is not generally known, and probably a considerable number of small occupiers are paying Land Tax who need not do so.

TEIND, MINISTERS' STIPEND, AND HERITORS' ASSESSMENT.

It would be easy to fill a volume in writing on the subject of the law of teinds as it affects agricultural lands. The question is so technical that a detailed consideration of it

would be out of place within the scope of an article such as this. Happily there is less need to refer to the question in detail than at any former period. A Bill is now before Parliament with the object of terminating, within a limited number of years, all payments of stipend in victual, and the substitution of money payments to parish ministers. The annual payments which owners of land will require to make will then be fixed, and not subject to variation with the price of grain. The smaller annual payments will be redeemed on a specified basis, and owners of land will have the option, if they so desire, of voluntary redemption where the annual payment of stipend as finally fixed exceeds £1.

Heritors' assessment levied for the upkeep of churches and mansees will also cease, the Church becoming responsible for the upkeep of all fabrics.

All owners of land will have to consider carefully how the proposals of the Bill, when it becomes an Act of Parliament, will affect them personally. In few cases can a settlement be reached without skilled legal advice, and for that reason no attempt is made to discuss the matter further in this article.

COUNTY RATES.

The rates levied by County Councils are the simplest and most easily understood of the various demands made by the Tax Collector or public authorities. The actual rent as appearing in the Valuation Roll is the basis of assessment without any deductions. The only exception is that under the Agricultural Rates Act, 1923, both owners and occupiers of agricultural lands are assessed on one-half of the land rental. The owner-occupier is thus assessed on the full rental of his land instead of upon twice the rental as formerly. The Act of 1923 provides for the repayment by the owner to the occupier of one-half of the rates on land payable by the latter. Thus in effect the owner is paying on three-fourths of his rental, and the occupier on one-fourth. The owner's rates are slightly higher than the occupier's on account of what is known as the "Fixed Average Rate." This fixed or stereotyped rate was ascertained at the time of the passing of the Local Government Act in 1890, when the modern County Councils came into existence. The rate represents the amount which was wholly payable by owners previous to that date. Owing to the enormous increase in local rates in the past thirty years, the fixed average rate now forms only quite a small part of the owner's share of county rates.

Certain of the County Council rates are levied equally over the whole county, such as the assessment for Police, Valuation, Diseases of animals, Registration of voters, General purposes,

and Lunacy. The assessments for roads and public health are levied by districts. Special district rates are levied for certain limited areas, usually for water supplies or drainage, but also for scavenging and lighting.

PARISH RATES.

The parish rates, collected by Parish Councils, are of older date than the county rates, and are more complicated, for the reason that they are not levied on the annual rental as appearing in the Valuation Roll, but are subject to varying percentage deductions for lands, houses, &c. Moreover, these percentage deductions often vary considerably as between adjoining parishes. The theory of the deductions is to allow the owner to pay on the nett rent which he actually receives—that is, the gross rent, less the owner's rates and the cost of upkeep and maintenance. The percentage allowance must, however, be applied equally to both owner and occupier, so that the curious anomaly arises, where the owner and occupier are different persons, that the owner receives an allowance which is inadequate for the purpose for which it is intended, while the occupier, who has no owner's rates to pay and only tenant's repairs to perform, gets an equal deduction, considerably in excess of the actual expenses of maintenance to him. Many parishes were, until recently, only allowing from 5 per cent to 10 per cent deductions on lands. This is obviously insufficient, and some parishes are now raising their percentage considerably. Allowances of from 10 per cent to 33 per cent are quite commonly given on houses.

Under the provisions of the Agricultural Rates Act, 1923, the owner and occupier are assessed upon one-half of the rental, as in the case of county rates. The percentage deductions are, however, calculated first, and the net assessable rental of the lands is then halved. Owners are liable to occupiers for repayment of one-half of the occupier's rates in the same way as for county rates.

The Parish Council rates are :—

1. The Poor Rate, which is both raised and expended by Parish Councils.
2. The Education Rate, which is raised by Parish Councils, but merely in order to meet the requisition of the County Education Authority, which has entire control of the expenditure.
3. Registration Rate for payment of salaries and fees in connection with the registration of births, deaths, &c.
4. Special parish rates levied for the maintenance of cemeteries, footpaths, &c. A special parish rate may not exceed 6d. per £.

It may be noted here that the one-half of the occupier's rates on land which is repayable by the owner is reckoned as owner's rates for the purpose of arriving at the proper deduction for Schedule A income tax. If an insufficient deduction for rates has been given, a taxpayer is entitled at the end of the financial year to make a rates claim in order to recover the income tax overpaid.

It is very desirable that every ratepayer, large or small, should understand the rules and general principles of rating and taxation. Only if he or she does so is it possible to check assessment notices.

The Highland and Agricultural Society, in conjunction with other agricultural bodies in Scotland, has nominated representatives to the Conference upon agricultural policy which has recently been convened by the Government. The inquiries of that Conference will no doubt cover a wide area, and it is fairly certain that the incidence and burden of rating and taxation upon agricultural land must be taken into consideration. For this reason it is of special importance for all owners and occupiers of land to apply their minds to the problem as it exists to-day. It is a somewhat striking fact that the annual value of houses and lands, as ascertained for the purpose of income tax, is no more than about one-sixth of the total national income assessed for tax. It therefore follows that the whole rates of the country are being assessed upon one particular class of property, which represents only one-sixth of the national income. Grants from the National Exchequer are no doubt made for such services as the police, public health, roads, education, &c., but these grants are clearly inadequate to redress the balance.

An inquiry into the question of local rating in Scotland was conducted in 1921 by a Committee presided over by Lord Dunedin. The remit to that Committee was somewhat limited, but, nevertheless, they produced a report which contains several recommendations of practical value.

The conclusion of the report contains certain paragraphs which are deserving of wider publicity, and are specially appropriate at the present time.

Paragraph 112. "We have in the earlier portion of our report pointed out with some insistence that the whole system of rating as it exists takes heed of only one sort of property or of occupation of property as the badge of wealth, and leaves others out of account."

Paragraph 114. "Parliament should recognise that the present system of rating is near its breaking-point. The breaking-point consists in this, that any enhancement of burdens will be fatal to the house-building problem, and will also be very inimical to the development of commercial and agricultural enterprise."

Paragraph 115. "Recognising these facts, Parliament ought to be chary of imposing new burdens on the rates by legislation, especially when the burdens are to provide for something which is rather a national than a local interest."

Paragraph 116. "Local spending authorities should set rigidly before their eyes the practice of economy. Economy is not easy to secure, but this important factor in the alleviation of the existing burden of rates cannot be too strongly emphasised, and unless it is kept in view the situation can only go from bad to worse."

Among the recommendations made by the Departmental Committee are:—

(1) "That the present system of dividing rates between owner and occupier should remain.

(3) That in counties the stereotyped or 'average' rate should be abolished, and all rates charged half on owner and half on occupier.

(4) That Section 37 of the Poor Law (Scotland) Act, 1845, should be repealed, and all rating placed on gross valuation. Failing this, that the deductions permissible to Parish Councils under that section be fixed on a uniform scale by a central authority.

(8) That the Agricultural Rates Act should remain in force without alteration.

(10) That small landholders be subject to rates on their buildings, and that in particular all loss of rates caused by the exclusion of buildings and improvements under recent land settlement schemes should be paid to the respective rating authorities by the Board of Agriculture.

(16) That as our fundamental conclusion we express the opinion that the existing system of rating is over-burdened and near the breaking-point, and that rigid economy is called for, not only as a measure of financial justice, but to avoid the social catastrophe which is inevitable if new enterprise in house building, agriculture, and industry continues to be checked by the undue use of a system of local taxation which relies on rates on land and buildings as its sole fiscal expedient."

Without entering upon controversial questions, there will surely be agreement among those best acquainted with the land of Scotland that the principles of "ability to pay" and "benefit received," if fairly applied to the rating and taxation of agricultural subjects, must result in the lightening of the burden which is placed upon the agricultural industry at the present time.

SCIENTIFIC FARM MANAGEMENT.

By JAMES WYLLIE, B.Sc., N.D.A. (Hons.), N.D.D., Advisory Agricultural Economist, South-Eastern Agricultural College.

THE story of the application of science in agriculture is like an absorbing serial in which the concluding chapter has yet to be written. Chapter after chapter unfolds a wonderful record of discoveries—of how to ensure larger crops of superior quality by the judicious selection of modern varieties and by the rational use of manures and lime; of how to secure larger yields of milk by means of milk-recording, systematic feeding, and the use of properly bred sires; of how attacks of plant and animal diseases may be obviated or at least alleviated; and so on throughout a wide range of activities. So far the story has rather tended to give the impression that the primary object in agriculture is to produce ever-increasing quantities of ever-improving qualities of the various food-stuffs required by the ever-growing non-agricultural community. It is true that passing references are made to the monetary benefits to be derived from these numerous discoveries, but there is little or nothing to indicate, certainly no attempt to emphasise, the fact that in the last resort the farmer, like any other business man, is chiefly and fundamentally concerned with the *net* financial return from his various operations. Indeed, it is perhaps not unnatural that the scientist should almost unconsciously come to regard his discoveries as an end in themselves, whereas the farmer must regard them strictly as a means to an end—the end being increased net profit from the farm as a whole. This last chapter, when written, will probably be entitled “Scientific Farm Management.”

In the first place, it is necessary to make it quite clear that there is no desire to minimise or disparage in any way whatsoever the value of the discoveries indicated above, not only (and especially) from the national point of view but also from that of the individual rent-paying and profit-seeking farmer. In fact, the need for scientific farm management has grown to a large extent out of those very discoveries—a fact which may partly explain why the scientist has so far paid comparatively little attention to the study of this aspect of farming.

Under the comparatively simple systems of farming which

obtained even sixty or eighty years ago, the problems of the farm manager were nothing like so difficult as they are to-day. On all hands there is now a much wider choice, many more alternatives. Not only does this apply to the raw materials—manures, feeding-stuffs, seeds, &c.—which the farmer uses, but also it applies to his choice of the general system of farming, to methods of cultivation, to kinds of live stock and methods of feeding, as well as to the kind of machinery to use, the methods of buying and selling, and so on. To-day, the British farmer has to face world-wide competition—a competition that is increased in severity by discoveries of science in every civilised country—and at the same time he demands a higher, or at least a more expensive standard of living, which again is partly due to scientific discoveries in the field of engineering and in other fields. Even in the legal sense the farmer has now a greater freedom in cropping and greater security of tenure than he had no more than twenty years ago. In short, modern farming is an extremely complex business; the average farm has a much more delicate mechanism than it generally gets credit for, and it is often by no means easy to predict correctly the ultimate effect of the introduction of an improved process upon the net financial return or profit. It is, therefore, quite logical that the last chapter in the story should deal with the science of farm management.

To change the figure: we can imagine two bodies of workers engaged in the construction of a massive arch to be called "Scientific Farming." On the one side, the "practical farmer" has made great strides in his methods of breeding, feeding, manuring, and cultivating—due in great measure to improved means of education and communication; on the other, the scientific agriculturist and "pure scientist" have also made great progress, but a gap remains. It is true that there is not now that degree of suspicion and scepticism amongst farmers that there used to be towards anything and any one labelled "scientific," and it is equally true that there are now improved facilities for transmitting, in an intelligible way, the findings of the scientist to the farmer; but still a gap remains—a gap which will be filled by the keystone called "Scientific Farm Management."

Now let us try to analyse what is meant by this term; and first let us distinguish clearly between "scientific farming" and "scientific farm management," for the latter is merely a part of the former. It is usual to think and to speak of the scientific farmer as one who has at least a working knowledge of the various "sciences"—chemistry, botany, physiology, dynamics, &c.,—a knowledge that enables him to understand more easily what is meant by "balanced manuring," "album-

inoid ratio," "Mendel's Law," "calorific value," and what not; and there is a common impression amongst farmers that such a man is not necessarily, or even probably, a financial success—an impression that has at least some foundation in fact. Agricultural scientists have freely admitted the importance of efficient management in successful farming, but they have been slow to admit that there is such a thing as the science of farm management. They speak of scientific breeding and feeding of animals, of scientific breeding and manuring of crops, but seldom, if ever, of scientific management. Again, it is difficult to avoid giving a wrong impression regarding the utility of science, as hitherto defined, to the practical farmer; but there is no denying the fact that financial failure in farming is far more often due to inefficient management than to lack of technical knowledge on manuring, feeding, seeding, &c. As Professor Warren, an American authority, puts it: "More farmers fail because of poor farm management than because of poor production. This is to be expected, since the principles of crop growth are much the same as they always were, while the proper organisation of the farm changes with every new invention."

Let us consider this for a little. The scientist can give the farmer most valuable help in the economical feeding of a lot of bacon pigs, but the farmer is far more concerned to know whether to keep bacon pigs and if so on what scale to keep them. Here is a particular field which the farmer wants to crop as *profitably* as possible. If he decides to grow wheat or barley or mangels or any other crop the scientist will advise him how he should manure the selected crop, what variety of seed he should sow, and how he can prevent or alleviate insect and fungoid attacks in order to get the maximum yield; but the real problem of the farm manager is to decide *what* crop to grow or what combination of crops and whether he should aim at the maximum yield or at something less, and if the latter how much less. Science has shown that silage can be successfully substituted for roots as a winter food for many classes of stock, and that "farmyard manure" can be made by artificial means, but it has not shown—and as presently defined never will show—under what conditions these innovations can be profitably effected.

Generally, the position may be summed up by saying that once the farmer has decided upon a course of action—what crops to grow, what stock to keep, whether to grow roots or silage crops, whether to make dung from straw in the old-fashioned way with cattle and cake or in the scientific way with sulphate of ammonia and chalk—the scientist can give him most valuable aid in carrying it through in the most efficient manner.

It is perhaps not sufficiently realised that, from this point of view, the farmer has a dual function to fulfil—viz., (a) that of the “works-manager,” and (b) that of the “general manager” or managing director. To the works-manager, technical knowledge is of immense value, indeed essential to the proper performance of many of his duties; but success or failure lies mainly in the hands of the general manager, who has to decide what to produce, when and how to buy and sell, how to organise the various departments or branches so that their different processes are efficiently co-ordinated. The “works-manager” may feed his horses in the most economical manner and on the most scientific lines, but the economic efficiency of the “horse-labour department” will be primarily determined by the policy of the “general manager,”—the degree to which he is successful in providing useful work for the horses all the year round, whether he decides aright regarding the relative economy of breeding and buying horses, regarding the comparative merits and demerits of the horse and the tractor as the source of tractive power on the farm. It is the writer's contention that, just as the works-manager is chiefly concerned with science as hitherto defined, so the general manager is coming to look upon the science of management as being his most powerful weapon in the struggle for profits.

There can be no gainsaying the fact that the increasing amount of attention given during the last thirty or forty years to methods of manuring, feeding, seeding, &c., has had the unfortunate, though unintentional, effect of overshadowing the importance of management and organisation in successful farming from the financial point of view. Take milk production as an example.

Science has fully and conclusively demonstrated what can be done by systematic milk-recording and breeding towards the improvement of the average annual milk yield per cow; it has shown that large economies can be effected by systematic feeding based upon the milk records; but so far it has stopped there. It has not shown the extent to which the benefits from such improved methods can be counteracted by inefficiency in the general herd management, as well as in the general organisation of the farm.

One of the first objects in the investigation of farm management problems must be to indicate the relative importance of technical knowledge and managerial capacity. Let us suppose that the latter is responsible for 80 per cent of a man's success—and many authorities put it higher than that—and the former for 20 per cent, what would this suggest? First, it would follow that a 10 per cent improvement in technical ability would be of no greater monetary value than a $2\frac{1}{2}$ per cent improvement in managerial capacity. And,

second, take two farmers. A. is 60 per cent efficient in management but only 20 per cent efficient in technical knowledge; B. is 90 per cent efficient in technical knowledge but only 30 per cent efficient in managerial capacity. What are the relative chances of success? A's. combined mark will be 60 per cent of 80 plus 20 per cent of 20—i.e., 52; while B's. combined mark will be only 42—i.e., 30 per cent of 80 plus 90 per cent of 20. (Assuming for the moment that all other factors in success are the same for both.) Does not this suggest the explanation as to why the "college trained" man—strong in technical knowledge but lacking in managerial capacity—often fails where the everyday farmer—weak in scientific lore but comparatively strong in the science of management and organisation—succeeds?

It is indeed time that the term "scientific farmer" was given a new meaning—a meaning related to his ability, natural or acquired, in the science of farm management, as well as in the science of manuring, feeding, breeding, &c. Nothing would give a greater stimulus to the pursuit of science by the average farmer than the recognition of the fact that the truly scientific farmer must be skilled not only in scientific matters as usually defined, but also in the science of management; for, as Lord Bledisloe recently put it in discussing the economic value of agricultural science, "Its detachment from practical husbandry has often checked its progress, destroyed its vitality, and engendered well-founded scepticism and criticism."

To sum up this stage in the argument, the business of farming consists, first, of deciding upon general policy—what to grow, what stock to keep, how much arable and how much pasture, how and when to buy and sell, and, second, of deciding how to grow crops, how to feed stock, how to till the ground, and so on. It is in the latter sphere that science—as hitherto defined—has been mainly of service; it is to the former that the writer seeks to apply it also. It is contended that financial success in farming lies chiefly in the first sphere, and that the greatest efficiency in the second cannot be a substitute for inefficiency in the first.

So far we have been considering the science of farm management in very general terms, but it is now necessary to explain more specifically what it means and what it involves. And first let it be emphasised that the basis of this science is *Accounting*. It is by means of a suitable accounting system, and only by this means, that different systems of farm management can be intelligently investigated in the scientific manner, and the monetary benefits of scientific manuring, feeding, &c., established beyond cavil. Accounts are to the scientific farm manager what the microscope is to the bacteriologist

and pathologist, the telescope to the astronomer, and the analytical apparatus to the chemist.

The science of feeding, manuring, &c., consists partly in explaining the whys and the wherefores of what has become regular farming practice. It has *explained* why farmyard manure is of such inestimable value in building up a worn-out soil, why linseed cake and fresh milk are of such peculiar value in feeding stock, especially young animals, why liming and slagging and draining often yield such marvellous results.

Similarly, science applied to farm management would seek to lay bare why one person succeeds where another fails, why one system of farming succeeds where another fails, what factors are of greatest importance in financial success in farming, and what sort of training would be most likely to ensure that success. It is not sufficient to say that the successful farm manager must have shrewdness, application, alertness, imagination, and above all that undefinable something commonly called business instinct; for practical and scientific purposes we must be more specific, and our definition of scientific farm management must have its roots firmly imbedded in a proper accounting system.

It is no part of this paper to describe in detail a suitable accounting system, but rather to indicate the nature of the information which the scientific farm manager would expect to obtain from that system. In ordinary accounting, the chief and often the only aim in view is to show the net financial result of each year's operations, whereas in what is called scientific accounting the main object is to show, as exactly and as clearly as possible, how the final result has been brought about. The "practical" farmer is satisfied (or dissatisfied) with the result; the "scientific" farmer wants to know what factors are responsible for the result—not in general but in specific terms.

The question at once arises: what is a suitable accounting system for this purpose? There are some who will answer at once and with great assurance: it must be a system of cost-accounts. There are some who would have us believe that the key to scientific farm management is cost-accounting; fortunately, that is a much exaggerated claim. Some even go so far as to suggest that "scientific farm management" and "farm cost-accounting" are synonymous terms; if this were so, the chances of scientific farm management being generally practised by farmers would be small indeed.

Nevertheless, farm cost-accounting has no more strenuous advocate, no more faithful adherent than the present writer. As a means of research into the problems of farm management the agricultural industry can no more afford to be without cost-accounting than without research into animal and plant

diseases, animal and plant nutrition, animal and plant breeding, and so on. But the average farmer—to whom this article is primarily addressed—is little, if any, better qualified to undertake, as a regular part of his routine work, a system of cost-accounting than he is fitted to conduct research work in any of the subjects just named. These may seem strange words from one who has devoted many of the best years of his life to the study of farm cost-accounting, and who is more than ever convinced as to the urgent need for the development of this line of agricultural research. It is well over a hundred years since the farmers of this country were first urged to keep systematic cost-accounts. During and immediately after the war, costing was a word to conjure with. It is now taking its proper place as one link in the chain of agricultural research—a link which is in much need of strengthening.

To avoid misunderstanding, it may be well to point out that the term cost-accounting is here used in its full sense—as a method of accounting which aims at tracing the cost of each and every commodity on the farm right through from birth or purchase or seed-time until it is sold or otherwise disposed of, which aims at showing the cost of production of milk and also of home-bred down-calving heifers, of wheat as well as of mangels, of potatoes as well as of hay.

The first essential of an accounting system for the needs of the scientific farm manager is that it must be within his reach, in respect of its complexity and the time and labour required to practise it; and the second essential is that it should yield comparable results, not only from year to year on the same farm, but also, and especially, from farm to farm over a series of years. The latter essential will be discussed later on; meanwhile let us briefly consider the former.

And let us start at the foundation. If the only object is to discover the net profit or loss on the year's working then any system will suffice that enables the farmer to complete each year the two forms given below.

FORM I.—SUMMARY BALANCE-SHEET OF BLANK FARM AS
AT 28TH MAY 1925.

<i>Liabilities and Capital.</i>				<i>Assets.</i>			
Debts payable	..	..	..	Total valuations	..	..	..
Capital	..	..	..	Debts receivable	..	..	..
				Cash in hand	..	..	..
				Cash in bank	..	..	..
<hr/>				<hr/>			
£				£			
<hr/>				<hr/>			

**FORM II.—SUMMARY STATEMENT OF ACCOUNTS FOR YEAR
ENDED 28TH MAY 1925.**

Total valuations at 29/5/24	.. .. .	Farm receipts dur- ing year*	.. ..
Farm payments dur- ing year *	.. .. .	Farm debts receiv- able at 28/5/25	.. ..
Farm debts payable at 28/5/25	.. .. .	Sundry transfers to private ^{a/c}	.. ..
		Total valuations at 28/5/25	.. ..
<i>Net profit for year</i>		<i>or Net loss for year</i>	
	<u>£</u>		<u>£</u>

* Excluding debts payable and debts receivable respectively at 28/5/24, since these would appear in the statement of accounts for the year 1923-24.

All accounting systems, however complicated, have their foundation in these two forms, but it is clear that the information given is distinctly limited. To the individual farm manager, with whom we are chiefly concerned, such information would be of practically no value in providing clues to the strong and the weak points in the management, although from the wider socio-political point of view even such a simple accounting system would yield extremely valuable results, provided the second requirement above mentioned were satisfied.

The second stage is merely a development of the first. Consider the two forms given below and compare them with Forms I. and II.

[FORM III

BEGINNING AND END OF YEAR ENDING 28TH MAY 1925.

ASSETS.

Description.	Beginning of year.	End of year.	Increase.	Decrease.
Horses—Work				
Other				
Cows				
Other dairy stock				
Other cattle				
Sheep				
Pigs				
Poultry				
<div> <div> <div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> <div></div> </div> <div> <div></div> <div></div> <div></div> <div></div> </div> </div> <div> <div>Classification would vary according to system of farming</div> </div> </div> </div>				
Total live stock	£			
General machinery, &c. . . .				
Tractor				
_____				
_____				
_____				
Total equipment	£			
Harvested crops in stock				
Growing crops, tillages, &c. . . .				
Total crops	£			
Purchased foods in stock				
Purchased manures do. . . .				
Purchased stores do. . . .				
_____				
Farmyard manure do. . . .				
Total raw materials	£			
Unexhausted improvements				
Total valuations	£			
Debts receivable				
Cash in hand				
Cash in bank (current $\frac{a}{c}$)				
Total assets	£			

FORM IV.—STATEMENT OF ACCOUNTS OF BLANK FARM

Description.	Cash Payments during year.*	Debts Payable at 28/5/25.	Total Expendi- ture.	Last Year's Total.
<i>Valuation</i> at beginning of year		
<i>Expenditure</i> during year, viz.				
Live stock purchased : Horses				
Cattle				
Sheep				
Pigs				
Poultry				
Equipment purchased : General				
Materials purchased : Foods				
Manures				
Seeds				
Stores				
Manual labour : Cash wages and N.H.I.				
Cottage rents				
Milk, &c.		
Household labour		
Rent and rates—less cottage rents				
Sundries : Live stock expenses				
Insurances (ex. N.H.I.)				
Repairs and small re- newals				
Hire				
Establishment				
Miscellaneous				
Total farm expenditure £		
<i>Net profit</i> (before charging income tax)				
Grand totals £				

* See note to Forms I. and II. above.

FOR THE YEAR ENDING 28TH MAY 1925.

Description.	Cash Receipts during year.*			Debts Receivable at 28/5/25.			Total Income.			Last Year's Total.		
<i>Income during year, viz.</i> . . .												
Live stock sold : Horses . . .												
Cattle . . .												
Sheep . . .												
Pigs . . .												
Poultry . . .												
Live stock products sold : Milk .												
Other dairy produce												
Wool												
Eggs												
Crops sold : Wheat												
Barley												
Oats												
Beans												
Peas												
Hay												
Straw												
Potatoes												
Other income : Hire-grazing, &c.												
Equipment sold												
Sundries . . .												
Transfers : Produce to farmhouse						
Produce to labour ^a / _c						
Other transfers to private ^a / _c						
Total farm income £						
Valuation at end of year												
[Net loss (before charging income tax)]												
Grand totals	£											

* See note to Forms I, and II, above.

Form III. will show exactly the same *Capital* at the end of the year as Form I., and Form IV. the same *Net Profit* (or loss) as Form II. (it is beyond the scope of this article to indicate how the mathematical accuracy of the results can be very easily checked); but in Forms III. and IV. we can see at a glance many things which are concealed in Forms I. and II.—how the valuation of each class of live and dead stock has changed during the year, whether the book debts are increasing or decreasing, whether a reduction in profit is due to increased expenditure or to reduced income and what items of expenditure and income are responsible, and so on.

There is ample evidence to show that this system of accounting—i.e., the system that would enable the farmer to complete Forms III. and IV.—is within the reach of the great majority of farmers. Difficulties will arise in some cases and with regard to occasional items of expenditure and income, but there is no reason why these should not be easily overcome if the farmer will avail himself of the advisory service which is now in operation all over the country.

We must now return to the second requirement—viz., that the results from year to year and from farm to farm should be directly comparable. Obviously it would be futile to compare the profit on one farm with that on another, unless the term profit was defined in exactly the same way in both cases; and yet there is no word that is used by business men in so many different senses as “profit.” Again, one farm may show a profit of 15 per cent on the invested capital and another one of 20 per cent, yet the difference may be entirely due to a difference in the basis of valuation of the live and dead stock, of which the capital is mainly composed. Two farms may each show an expenditure on labour of £300, but if the one farmer includes only cash payments as labour expenditure while the other includes also the cash value of allowances (cottage, milk, &c.) given “free” to the workers, then clearly direct comparison would be quite misleading. Take up a dozen farming accounts as they exist to-day, and what do you find? That direct comparisons are impossible, not only because of differences in the basis of valuation, in the method of dealing with allowances to the workers and with the “unpaid” household workers, but also on account of variations in the method of classifying assets, expenditure, and income. It is not claimed that the treatment shown in Forms III. and IV. above is the best that can be devised: it is merely the result of experience with several hundred cases, and is put forward mainly to illustrate the point at issue. As to the basis of valuation, that is a subject in itself; for the present purpose it is sufficient to emphasise the fact that

it must be uniform, otherwise comparable results on a capital basis will not be obtained.

The foundation for reliable comparisons, then, must be a definite terminology, uniform definition of the various terms used, and a uniform method of classifying the account data.

Let us now assume that we have made provision to secure comparable results; we have next to consider how they should be used. There must be some reason for thus striving after comparisons, and it is not far to seek. Take the case of the student. He scores 60 per cent in a certain examination, but we all know that whether he is satisfied or not depends mainly upon how many other students, with equal facilities, have scored over 60 per cent, and how many have failed to reach that standard. To score 60 per cent and be third on the list in a class of 100 will be reckoned a greater achievement than to score 70 per cent and be only tenth.

And so also with milk recording. A farmer may be satisfied with an average annual yield of 700 gallons per cow until he learns that his neighbour, with no more favourable conditions, has reached 750 gallons. The wide-awake farmer is always "looking over the hedge," and mentally, not to say vocally, comparing the results of his own efforts with those of others, always trying to profit alike from his neighbour's successes and failures. In each of the various economic investigations in which the writer has been engaged, the co-operating farmers have shown a marked keenness to know the results from other farms as well as those from their own farm; and this is far from being due to idle curiosity (because the identity of the farms is never exposed), but to a genuine realisation of the fact that it is by intelligent and reliable comparisons that they can find out at once the weak and the strong points in their management.

Let us keep clearly in mind that the object of our comparisons is to throw a searchlight upon the efficiency of the management, and we shall at once see the necessity for eliminating, as far as possible, those factors over which the management has little or no control. And first, of course, there is the weather. Nothing was more striking during the wet summer of 1924 than its levelling-down effect in the matter of the cleanness of the land. Many most capable farm managers were literally ashamed of the abundance of weeds, and some gave up the struggle against Nature in disgust. This is merely one small example. The point need not be laboured. Its bearing upon the present subject is that results must be averaged over a period of years in order to eliminate as far as possible the disturbing influence of the weather upon the farm manager's plans and operations.

Equally important is the fact that comparisons are likely

to be futile, if not grossly misleading, unless the data are obtained under conditions that are at least approximately uniform. In the wide sense, this applies to comparisons between farming methods and results in different countries, for it is seldom that the conditions are sufficiently alike to justify anything but the most guarded conclusions being drawn from such comparisons. For example, it is perfectly futile to argue that because "co-operation" has been eminently successful in Denmark it would be equally successful in this country but for the shortsightedness—to use no stronger a term—of the British farmer.

But the principle just stated also applies to comparisons within any given country, and especially in a country such as our own, in which there are such kaleidoscopic changes in farming conditions even within very narrow limits of space.

The individual farm manager has at his command a given area of land, so much labour, and so much capital, and it will be agreed that his efficiency must be judged by the use to which he puts these three agents or factors; but the problem is to find a reliable means of *measuring* that efficiency. How can his accounts be used to indicate whether he scores 40 per cent, 60 per cent, or 80 per cent as a manager? If only 40 per cent, how can they be used to indicate the weak points? Attempts have recently been made, notably by Mr A. W. Ashby, to devise a method by which a group of farmers taken at random could be arranged in order of merit according to their efficiency—*i.e.*, one figure is obtained which seeks to combine the efficiency with which each of the three factors above mentioned has been handled. So far as the writer can judge, the results from this method are not encouraging—in some cases, in fact, they are ludicrous.

In the meantime, at least, we must be content with something simpler. We must institute our comparisons within strictly classified groups, and not attempt to compare the efficiency of the 600-acre farmer with a large stock of sheep, and that of the 200-acre farmer, whose income is derived from corn and potatoes. It is not suggested that the farmer should never look beyond his own group, for if it can be shown that one group with a particular system of management is making consistently higher profits than he is himself, then obviously he should consider whether he cannot become a member of that group. Put in another way, the position is this. The milk-producing farmer may be much interested to know that corn and potato growers are making larger profits than he is himself, but he feels that that is no reflection upon his managerial efficiency; whereas the knowledge that neighbouring milk producers—nameless though they may be—are making higher profits will or should at once cause him to look around for the leakage. For the time being,

he feels that he must depend upon the records of those working under similar conditions to provide a measure of the strength or weakness of his various sections. In the long-run, he may consider scrapping his present system altogether, and joining another group in which better prospects are indicated.

Sufficient has now been said to show that the farm manager must test his efficiency, in the financial sense, by comparing his financial results with those of his brother farmers, and that these comparisons must be made within carefully defined limits rather than indiscriminately, as is usually the case at present. It now remains to indicate more specifically the lines on which useful comparisons are possible.

First of all, it will be very helpful to have a suitable background to the picture of financial results given by Tables III. and IV. above, and this would consist of a summary of the crops grown each year and the live stock kept. The following rulings are suggested :—

[TABLE V.

TABLE V.—SUMMARY OF CROPPING AS AT 28TH MAY
EACH YEAR.*

Crop	Total Acreages			Percentage of Total Acreage		
	1923	1924	1925	1923	1924	1925
Wheat						
Barley						
Oats						
_____						
_____						
_____						
Total corn crops						
Potatoes						
Turnips and swedes						
Mangels						
Cabbage						
_____						
_____						
_____						
Total fallow crops						
Temporary grasses for hay						
Temporary grasses for pasture						
Total temporary grasses						
Total arable						
Permanent grasses for hay						
Permanent grasses for pasture						
Total permanent grasses						
Total acreage						

* The object is to show the cropping position as at the date of the balance-sheet, but some may prefer to show it as at 4th June each year to correspond with the official cropping returns.

TABLE VI.—SUMMARY OF LIVE STOCK AS AT 28TH MAY
EACH YEAR.*

Class.	Total Number			Number per 100 Acres.		
	1923.	1924.	1925.	1923.	1924.	1925.
Horses : Work						
Other						
Cattle : Cows and first calf						
heifers						
Other cattle over one						
year						
Other cattle under one						
year						
Sheep : Ewes						
Other sheep						
Pigs : Sows						
Other pigs						
Poultry : Hens						
Ducks						

* See note under Table V. In this case it will be a great help if a corresponding Table is made at 28th November each year.

The object of completing Forms V. and VI. will be quite clear: suffice it to say (1) that they will be very useful in seeking to explain differences in Tables III. and IV. above; and (2) that those who understand graphs will realise that there is here an excellent opportunity for practising this method of comparison.

Let us now return to Forms III. and IV. as they stand. The data on these forms will not be directly comparable, and must be reduced to a common basis. In Form III. it will usually be sufficient (1) to convert each item into so much per acre; and (2) to calculate the percentage which each item in the valuation bears to the total valuation. These two calculations will enable direct comparisons to be made amongst the different farms in each group; they will show, for example, the varying amounts of capital invested per acre and of what it is composed, the proportion of the capital that is locked up in machinery and implements, and so on.

Table IV. requires somewhat more detailed treatment. First, it is best to find the difference between the total valuations at the beginning and end of the year, and call a decrease an "expenditure" or an increase an "income," since it is clear that a decrease in the valuations is equivalent to expenditure and an increase to income.

We can now put our data into comparable form as in Table VII. below :—

TABLE VII.—DISTRIBUTION OF EXPENDITURE AND INCOME.

Item.	Per Acre.			Percentage of Total.		
	Your Farm.	Average for Group.	Average of 5 Best.	Your Farm.	Average for Group.	Average of 5 Best.
Live stock purchases .						
Equipment purchased].						
Total manual labour .						
Rent and rates .						
Other expenses .						
Decrease in valuations .						
Total expenditure £				100·00	100·00	100·00
Live stock sales .						
Live stock product sales						
Crop sales .						
Other income .						
Transfers to personal						
a/c, &c. .						
Increase in valuations .						
Total income £				100·00	100·00	100·00

It will be noticed that this table incorporates only the principal sections of Table IV. It is generally better to aim first at broad comparisons in order to see the outstanding differences, and then to dissect further the sections in which differences exist, although this method is not without its pitfalls, for it may conceal vital differences in details.

Finally, we can now obtain a very large number of comparisons, of which it is possible to indicate only a few. In each case comparison may be made, as above, not only with the average of the group but also with the average of the five or six best farms—*i.e.*, the farms on which the “best” results have been got. Here is a list of useful comparison headings :—

1. Size of farm : (a) arable, (b) permanent grasses.
2. Percentage arable.
3. Number of work-horses (a) per 100 acres total, (b) per 100 acres arable.
4. Number of “standard” men (a) per 100 acres total, (b) per 100 acres arable.

5. Capital per acre.
6. Net profit per acre.
7. Percentage profit on capital.
8. Gross income per acre (or turnover).
9. Relation between turnover and capital.
10. Labour expenditure per acre }
 Rent and rates per acre }
 Profit per acre } net output per acre.
11. Relation between labour expenditure and gross income.
12. Relation between rent and rates and profit.

There can be no shadow of doubt that data collected on the above lines from several hundred carefully classified farms would yield information of inestimable value, alike to the individual farm manager and to that now fairly numerous body of agricultural advisers. Nothing is more remarkable and more hampering to the student of farming problems than the extreme paucity of reliable statistical data upon which conclusions can be based regarding the relative efficiency of different farmers and of different systems of farming under different conditions.

Take the wages question. How many farmers firmly believe that *the* great item on the expenditure side of the account is wages, and yet in a large proportion of cases a reduction of 10 per cent in the price of the raw materials (foods, manures, &c.) would be of greater monetary value than a similar reduction in the wage bill. How many farmers believe that the road towards financial salvation lies in cutting down the expenditure on labour, and yet some evidence exists to show that in many cases insufficient labour is already employed *in proportion to* the capital invested. And so one could give numerous examples of the searchlight of "fact" that would be shed upon the mass of "opinion" that presently dominates the position of the farm manager in his struggle towards better and more profitable methods.

A brief reference may now be made to three further points. First, during recent years many competitions have been held for the "best-managed" farms, for the best milking herds, and so on, and it is a curious anomaly that in very few cases have the awards been related in any way to the actual financial results of the management. Since these competitions are generally promoted by farmers themselves, can they wonder, still less complain, if the scientist has followed their example and tried to judge the efficiency of the farm management by appearances only, and without the acid test of the balance-sheet and profit and loss account?

Second, it will be asked: How is all the clerical work involved in such a scheme as is outlined above to be overcome? Surely the answer must be: In the same way as

it has been overcome in the milk-recording scheme, which is now so firmly established as an aid to efficient farm management. The individual farmer would be responsible for the original records—Tables III. and IV.—but the actual tabulation of the results in each group would be done on a co-operative basis, as in milk recording. Initially, difficulties would be experienced just as in the milk-recording schemes, but as soon as sufficient data were collected to demonstrate their value, the scheme would grow by its own momentum. We commend the idea to the careful consideration of farming organisations of all kinds.

Lastly, it will probably be urged as a fatal obstacle to any such scheme that no business man can be expected to make public the actual profit or loss on each year's working. And the answer is that this would not happen. As indicated in Table VII. above, each farmer would have his own results compared with the *average* results from other farms, and since all the data would be tabulated under a code-number, the risk of undesirable disclosures being made would be practically negligible. It is a well-known fact that farmers are demanding more information relative to the profits made by the numerous middlemen who handle their products. They are entitled to that information, but they are also entitled to provide the general public with authentic data regarding the profits (or losses) which they themselves are making. Selected individual cases prove nothing; what is wanted is classified data over a large number of cases.

In conclusion, a few words are necessary to meet the point of view of those who are in a position to go a step further than the system of accounting here referred to. The next stage in the development of scientific accounting is a system of "departmental" accounts—sometimes erroneously called cost accounts—in which the farm is divided into so many sections or departments—arable, pasture, dairy, sheep, pigs, &c.—according to the system of farming. Then, taking Form IV. as the basis, the various items of expenditure and income are apportioned over the various accounts, while in addition "internal transfers" are made from one department to another—mangels from "arable" to "dairy," dung from "dairy" to "arable," and so on. The final result aims at showing as accurately as possible the net profit or loss on each department—incidentally, it may furnish certain costs of production. There are many cases where such a system can be introduced with little difficulty, but until it has been thoroughly tested on a large scale and the accuracy of its results checked with the aid of a complete costing system, it would be unwise to recommend it for general adoption by the scientific farm manager.

And finally, there is the complete full-fledged system of

cost accounting. For the investigation of particular problems, as, for example, the cost of production of sugar-beet, this system of accounting is invaluable, and cannot be ignored. As a weapon of research nothing can take its place; but it is only a small proportion of farm managers who are in a position to use such a weapon without considerable assistance from some public body with public funds. Scientific farm management must be something that can be practised by the average farmer, and it is for this reason that in the meantime, at least, it appears that attention should be concentrated upon a system of financial accounting which deals with the farm as one organic whole. Let us never forget that the key to successful farming lies in the efficiency of the management, and that the acid test of efficiency is the net financial result over a period of years from the farm as a whole.

CIRCUMSTANCES INFLUENCING THE YIELD AND QUALITY OF MILK.

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ONE of the chief features of British agriculture in recent years has been a marked development of dairy farming, and particularly of the production of milk for sale. This development has been accompanied by a greater interest in the technical aspects of milk production, and has given rise to a demand for reliable information on many points. One of the most important of these is the feeding and management of dairy cows, and the effect of different methods and conditions on the quantity and quality of the milk produced.

The specific effects of different circumstances on the yield and chemical composition of milk are frequently dealt with in the reports on the experimental work carried out by the various agricultural colleges, but it is desirable that from time to time an attempt should be made to summarise the present-day knowledge on this subject, having due regard to the gaps yet to be bridged, in order that the general agricultural reader may have such information in coherent order and within easy compass. It is the object of this article to provide such a summary.

For many years the farmer's interest in one phase of this subject—namely, the quality or chemical composition of milk—was concerned primarily with the degree to which the milk he sold complied or failed to comply with the Milk Regulations under the Food and Drugs Act; but with the development of milk recording, an increased intensity of competition at show milking trials and in herd contests, and a keener interest in breeding for butter fat as well as for high milk yields, dairy farmers are now considering quality all the time, and hence any information which helps in correctly stating or interpreting private and public milk records is of direct benefit to sellers and purchasers alike.

It must also be explained that the term "quality of milk" in this article is used almost entirely with reference to the percentage of fat in milk. From the scientific aspect, quality of milk must necessarily be associated with its complete

chemical composition and its all-round wholesomeness, but so far as the commercial production of milk is concerned, mention of quality very frequently refers only to the percentage of fat. Three reasons for this custom may be mentioned—firstly, it is easier by chemical means to determine the percentage of fat in milk than to determine the amount of any other ingredient; secondly, the fat is the most variable constituent in milk; and thirdly, the value of milk for butter-making, and also to a large extent for cheese-making, is primarily dependent on the percentage of fat present.

The naturally occurring conditions which influence the yield and quality of milk are usually classified under the following heads :—

1. Breed of cow.
2. Individuality of cow.
3. Period of lactation.
4. Interval between milkings.
5. Efficiency of the milker.
6. Age of the cow.
7. Climate and weather conditions.
8. Health of the cow.
9. Kind and quality of food.

When the production of ordinary market milk is under consideration, the conditions affecting yield and quality which are the most important are the first five mentioned above. On the other hand, when it is a question of the yield and quality of the milk of an individual cow, conditions 2, 5, 6, 8, and 9 exercise the greatest effect—some one condition may perhaps be specially important at one time and another condition at another time. It is, therefore, important that farmers and others should study to what extent, if at all, the different conditions set out above affect the output from their own herds or cows, and information in this respect can best be given by considering each of the conditions separately.

1. Breed of Cow.—There is fairly general agreement as to the breeds of cows which give the largest yields of milk and the breeds which give the poorest and richest milk, but it is very difficult to prepare a table which shows the order of merit of all breeds. The tabulated statement given below is based on a careful study of records obtained in *British Milk Recording Societies so far as yield is concerned*, and in respect of the percentage of fat the classification is based on a study made of the chemical composition of the milk of representative animals exhibited at the Royal Agricultural Society of England's shows and the British Dairy Farmers' Association's Dairy shows held in London for the ten years preceding 1922.

CLASSIFICATION OF BREEDS IN ORDER OF YIELD.

- | | |
|----------------------------|---------------|
| (1) British Friesian. | (6) Red Poll. |
| (2) Dairy Shorthorn. | (7) Guernsey. |
| (3) Lincoln Red Shorthorn. | (8) Jersey. |
| (4) Ayrshire. | (9) Devon. |
| (5) South Devon. | (10) Kerry. |
| (11) Dexter. | |

CLASSIFICATION OF BREEDS IN ORDER OF FAT PERCENTAGE.

Breed.	At ten "Royal" Shows.			At ten "Dairy" Shows.		
	No. of Cows.	Average number of days since Calving.	Fat percentage.	No. of Cows.	Average number of days since Calving.	Fat percentage
Jersey . . .	181	91	4.64	163	121	5.10
Guernsey . . .	84	71	4.22	79	91	4.86
Longhorn . . .	26	64	4.09	..	..	..
Devon . . .	60	61	3.65	17	45	4.72
Dexter . . .	52	55	3.54	20	120	4.50
Kerry . . .	57	61	3.49	48	59	4.40
Dairy Shorthorn (Non-pedigree)	..	..	..	143	40	3.99
South Devon .	34	71	3.69	37	90	3.92
Dairy Shorthorn (Pedigree) .	199	48	3.52	187	41	3.75
Red Poll . . .	71	72	3.44	98	74	3.87
Ayrshire . . .	36	45	3.49	17	57	3.83
Lincoln Red Shorthorn .	77	55	3.44	67	59	3.60
British Friesian	47	58	3.28	58	68	3.63

The fact that the above percentages of fat are showyard results lessens their value to some extent, but in the absence of other authentic data based on the records of a complete lactation period or a year, they constitute an interesting comparison of the different breeds under approximately similar conditions. The figures also illustrate the difficulty of making a complete classification; in every instance the average percentage of fat at the "Royal" Shows is lower than that found at the "Dairy" Shows, and in some breeds (e.g., the Devon, Dexter, and Kerry) the difference is near 1.0 per cent. In the Dexter breed the greater lapse of time since calving in the case of animals exhibited at the "Dairy"

Shows might account for the higher percentage of fat, but no such explanation fits the cases of the Devon and Kerry breeds. Also in several breeds where the lapse of time since calving is almost the same (*e.g.*, the Dairy Shorthorn, Red Poll, and Lincoln Red Shorthorn) the percentage of fat at the Royal Show is appreciably lower than at the Dairy Show.

It is astonishing that, in spite of the increased attention given to the percentage of fat in the milk of the different breeds, it should be so difficult to get sufficient information to enable an accurate comparison to be made. The systematic testing of the milk of individual cows as carried out by the Scottish Milk Records Association is invaluable in this respect so far as cows recorded in the different Scottish Societies are concerned, but in England much less has been done to encourage methodical butter-fat testing, and there is no uniform system adopted by all societies and breeds for sampling or testing, or for working out the average percentage of fat for a fixed period of time. It is to be hoped that definite steps will be taken to remedy this defect in the course of a year or two.

So far as showyard results are concerned, one definite advantage is that the methods are uniform from year to year, and that by a close study of the available data it will be possible to work out valuable comparisons for five to ten-year periods in the future, and thus note any definite improvement or retrogression.

2. *Individuality of Cow.*—Cows of the same breed give milk showing a great variation in yield and quality; in fact, in almost every dairy breed there are to be found cows which yield 300 to 400 gallons of milk annually, and others which yield 1000 to 2000 gallons or even more. The percentage of fat likewise varies according to the individuality of the cow, and the range of variation is surprisingly great. On this point, however, no attention should be paid to the results of a single test, which may well have been influenced by exceptional conditions of health and milking, and therefore be in no way typical of the milk yielded by that cow under normal conditions. In order to make a fair comparison of the yield and quality of the milk of one cow with another it is essential to have the yields made, and the samples tested under conditions which are reasonably similar.

There is a common belief that a high yield of milk and low percentage of fat usually go together, and this is indeed often the case, but it is most important for breeders of pedigree stock to realise that there are exceptions where the capacity for a high yield and a high fat percentage are possessed by one and the same cow. For the purposes of breed improvement, and even for the maintenance of the fat percentage of a breed where cows and bulls are usually bought on records of

yield only, it is most important to discover such cows, and, when they are discovered, to look after them carefully, and to regard them as most important sources of herd and breed improvement.

Professor Wilson of Dublin, after a careful study of the records of several thousands of Ayrshire cows, was definitely of the opinion that the inheritance of quantity and quality were independent of each other, and therefore that it should be possible to unite in the progeny of selected parents the two qualities of large yield and high fat percentage. This must not be taken to mean that the yield of a Friesian and the fat percentage of a Jersey could be combined in one animal, but rather that progeny of selected parents of the same breed could be bred to possess a high yield and a high quality for that breed. There is also an abundance of evidence from Denmark proving that this dual improvement in yield and quality is practicable under ordinary farm conditions where the necessary records have been kept and used in the selection and mating of sires and dams.

The following table supplies instances from different breeds, showing different combinations of milk yield and percentage of fat, and illustrates the differences of individual cows of the same breed.

THE EFFECT OF INDIVIDUALITY ON YIELD AND FAT PERCENTAGE.

Breed	No of Calves	Yield of Milk in 12 months	Evening Milk		Morning Milk		Total Milk.	
			No of Tests	Fat per-centage	No of Tests	Fat per-centage	No of daily Tests	Fat per-centage
lb								
Shorthorn (a) .	5	13,137	12	4.40	12	3.75	12	4.01
„ (b) .	2	9,837	8	3.70	8	3.00	8	3.28
„ (c) .	4	6,882	6	3.90	6	2.85	6	3.27
„ (d) .	3	6,700	10	4.45	10	3.75	10	4.03
Friesian (a) .	4	18,005	..	..	..	..	7	4.00
„ (b) .	4	17,408	..	..	..	..	7	3.00
„ (c) .	3	9,756	..	..	..	..	7	2.90
„ (d) .	3	8,054	..	..	..	..	7	3.80
Ayrshire (a) .	4	11,130	..	..	..	..	..	4.00
„ (b) .	3	11,030	..	..	..	..	..	3.20
„ (c) .	4	7,890	..	..	..	..	..	3.40
„ (d) .	2	6,650	..	..	..	..	..	4.00

It is a reasonable assumption that the above figures represent the state of affairs in many dairy herds in this country, and in order that farmers and breeders may realise the degree to which it has been found possible by breeders in another country to increase the yield of milk and the percentage of fat in the milk at the same time by selective breeding, the following table, extracted from a Danish report, is given :—

Breed.	Year.	Average Yield of Milk.	Average Butter Fat.
		lb.	Per cent.
Red Danish . . .	1905-06	9,427	3.40
„ . . .	1915-16	11,282	4.30
„ . . .	1900-01	9,104	3.45
„ . . .	1914-15	10,366	4.19
Jutland . . .	1900-01	5,315	3.09
„ . . .	1916-17	8,175	3.87
„ . . .	1897-98	5,922	3.01
„ . . .	1913-14	8,538	3.84
Shorthorn . . .	1903-04	6,349	3.30
„ . . .	1915-16	9,445	3.85
„ . . .	1901-02	6,864	3.62
„ . . .	1911-12	10,164	4.06

The definite improvement in the yield and quality of the milk which the above figures illustrate should be a great encouragement to breeders in this country to take the necessary steps to find out the individual animals which possess the qualities of high milk yield and high fat percentage, and to treasure them as sires and dams of much more than ordinary merit.

3. *Period of Lactation—Effect on Yield.*—The general effect of advancing lactation on the yield of milk is well known, though the degree to which a good cow, properly fed and managed, will maintain a high yield for months after calving is not fully realised by many dairy farmers. Generally speaking, the yield increases quickly after calving, and the maximum output of milk is attained by the third or fourth week. In the case of exceptional cows which have been carefully fed, the maximum may not be attained until the fifth or sixth week after calving, and there may be little diminution in the milk yield until four or even five months have elapsed. With average cows there is usually a slight decrease noticeable by

the third month, and thereafter the fall is gradual until the cows go dry. A study of milk record statistics has shown that in the case of cows managed on the basis of producing one calf per annum, the average lactation period is about forty-three weeks, and the average dry period is nine weeks.

The rate at which the yield declines in the course of the lactation period is, however, often influenced by the feeding, especially by turning out of cows to pasture, and this point is further referred to on page 140.

Effect on Fat Percentage.—With slight exceptions the effect of advancing lactation on the percentage of fat is the reverse of the effect on yield. The first exception is that the percentage of fat is frequently very high for a short time after calving—even though the milk yield is then rising rapidly. Abnormally high percentages may be obtained at this stage, hence the regulation in respect of Dairy Show Milking Trials and Butter Tests forbidding the exhibition at the show of cows and heifers which have calved within fourteen days of the opening of the show. If the cow is in high condition and well looked after, the percentage of fat will remain at a higher figure for some weeks than would be the case if the cow calved down in poor condition. (See also under Effect of Feeding, p. 143). Under average conditions, however, the percentage of fat falls to its lowest at about four to six weeks after calving (i.e., at the time of the highest yield), and later as the yield decreases the fat percentage increases, and this continues until the cow goes dry. During the last month in milk the highest percentages of the whole lactation period are usually found, but there are also instances when the percentage falls unaccountably even though the daily yield is less than 10 lb. of milk.

The belief is held by some that the *weight* of butter fat produced daily by a cow is fairly constant, and that the variation in the percentage of fat is due to the rise and fall in the yield of milk. This idea is wrong, as the following figures, which are averages for a number of cows of different breeds, will show :—

MONTHS AFTER CALVING.

	1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.
Daily Average Yield of Milk in lb.	25.1	26.0	23.8	21.2	19.6	19.8	19.0	16.0	12.5	9.4	5.6
Daily Average Yield of Fat in lb.	0.98	0.95	0.84	0.79	0.78	0.75	0.72	0.60	0.48	0.41	0.26
Monthly Average Percentage of Fat	4.02	3.74	3.71	3.84	3.87	3.90	3.94	3.89	3.92	4.19	4.58

The yields of milk and percentages of fat given above exemplify the normal changes which take place in the course of the lactation period, and the weight of fat per day is shown to be the highest at the beginning of the period, and to fall gradually thereafter.

4. *Interval between Milkings.*—The general rule as regards the effect of the length of the interval between milkings on the yield and quality of the milk is that the shorter the interval the smaller the milk yield and the richer the milk, and conversely, the longer the interval the greater the yield and the poorer the milk. Where cows are milked morning and evening only and at equal intervals there is very little difference between the yield and quality of the milk obtained at the two milkings. Where the intervals are about fourteen hours and ten hours (i.e., morning milking 5 A.M., and evening milking 3 P.M.) the morning's yield will be about 40 to 50 per cent higher than the evening's. For example, a cow yielding 40 lb. milk daily may be expected to give 15 to 17 lb. in the evening and 25 to 23 lb. in the morning. With the same intervals the average percentage of fat in the morning's milk will be about 1 per cent of fat lower than in the evening's milk—typical figures for a Shorthorn herd being 3.40 per cent fat in the morning and 4.20 per cent in the evening. In those exceptional and unfortunate instances where the intervals are still more unequal—for example, sixteen hours and eight hours—the morning's milk will be nearly twice the volume of the evening's milk, and the percentage of fat will be much greater in the evening than in the morning. One herd of twenty-four cows tested monthly under the writer's supervision and milked at intervals of $15\frac{1}{2}$ and $8\frac{1}{2}$ hours, showed an average morning fat percentage of 3.34, and an average evening percentage of 4.44. Some cows in the herd showed a much greater difference in quality from evening to morning than others—e.g., cow (a), morning, 3.00 per cent; evening, 5.00 per cent—*difference*, 2.00 per cent; cow (b), morning, 3.20 per cent; evening, 3.90 per cent—*difference*, 0.70 per cent; cow (c), morning, 3.20 per cent; evening, 4.80 per cent—*difference*, 1.60 per cent; cow (d), morning, 3.45 per cent; evening, 4.35 per cent—*difference* 0.90 per cent.

There is no doubt that the effect of unequal hours of milking is the commonest cause of mixed morning's milk falling below the presumptive standard of 3 per cent fat. With a night interval of over fourteen hours during the months of May and June, the morning's milk from ordinary herds must be often near, and probably frequently under, the standard through no fault of the farmer or his cows. The needs of the consumer and the trade, and sometimes the railway service, compel the unequal intervals. When distribution and railway transit can be so organised that milking can be done with

night intervals not exceeding thirteen hours, much of the difficulty associated with milk "under the standard" will disappear.

When milking is practised three times daily under ordinary farm conditions (say, at 5 A.M., 12.30 P.M., and 6 P.M.), the largest yield and poorest quality is obtained in the morning, and the lowest yield and highest fat percentage in the evening, while the results at the noon milking are between the other two. In the case of heavy-milking cows, where milking three times daily with approximately equal intervals of eight hours between the milkings is practised, there is as yet insufficient evidence obtained under experimental conditions to warrant a definite statement as to the proportionate quantities of milk and percentages of fat at each of the three milkings.

5. *Efficiency of the Milker.*—Milking should be carried out as quietly, quickly, and thoroughly as possible. Quickness not only results in a saving of time but gives an increased return. This increase may be as much as 10 per cent in the yield and up to 30 per cent in the weight of butter fat produced. The time taken to milk any one cow will vary according to the quantity of milk yielded and the ease with which the cow can be milked. Cows which are easy to milk and give large yields can be milked at the rate of 3 lb. milk per minute, but the average rate is probably about $1\frac{1}{2}$ to 2 lb. per minute. It is the custom in many Ayrshire herds to have two milkers milking the same cow at once—one at each side,—and this procedure makes for more rapid milking, and also possibly increases the percentage of fat somewhat above that obtained by milking in the usual way.

Thorough milking means careful stripping out. It is now well known that the percentage of fat in the "strippings" or last-drawn milk is appreciably greater than in the milk drawn off earlier, hence the need for thorough stripping; in fact the last few pounds of milk will as a rule contain twice the percentage of fat in the bulk previously obtained. Thorough stripping is an essential when a long interval has elapsed since the previous milking, in order that the percentage of fat in the mixed milk may be up to or above the legal requirement. Immediately preceding each "strip" there should be a brief upward pressure against the udder, in order that the largest possible quantity of milk in the milk cistern or sinus may be forced downwards, and each teat should be grasped as high up as possible preceding the downward pull. The skilful execution of this action is essential to thorough stripping, and the percentage of fat in the "strippings," and therefore in the milk as a whole, is thereby increased.

The value of daily milk recording as a means of increasing the efficiency of the milkers is not yet sufficiently realised. When the weighing of the milk is carried out at weekly or

longer intervals there is a natural tendency to be more efficient on these occasions. It should be the aim of the dairy farmer to make this occasional efficiency habitual, and daily recording when regarded as a means of encouraging the milkers, rather than as a means of detecting slackness, is most helpful in attaining this end.

6. *Age of the Cow.*—It is only within recent years that sufficient evidence has been collected to show that the percentage of fat decreases slightly as the cow advances in age. Many practical men reasoned that because a cow after her first calf was not fully grown and had to utilise some of her food for growth, the milk she produced would not be as rich as that produced later when the same cow was mature, and it has required the evidence of numerous tests to prove the contrary. In respect of yield there is a gradual increase up to the fourth or fifth lactation period, and it may be assumed in the case of a heifer calving at $2\frac{1}{2}$ to 3 years that the milk with the first calf will be 66 to 70 per cent of the amount which the same animal will be capable of producing as a mature cow; after the second calf, 80 per cent; after the third, 90 per cent; and after the fourth calf or fifth calf the maximum yield will be produced. For the next two to four years, if the cow remains a regular breeder and sound in health and udder, there will be little variation in the yield; but with older cows, after the seventh or eighth calf a diminution in yield is to be expected. The quality of the milk will be at its best after the first and second calves, but afterwards, other conditions being equal, there will be a slight decrease in the fat percentage as the cow ages.

The following table, taken from milk and butter-fat records of Ayrshire herds in Scotland, illustrates the variation with advancing age:—

Age of Cow.	Milk yield in gallons of 10 lb.	Percentage of maximum yield at each age	Butter Fat per cent
2 years	450 gallons	60.0	3.88
$2\frac{1}{2}$ "	495 "	66.0	3.89
3 "	565 "	74.0	3.89
4 "	656 "	87.5	3.74
5 "	721 "	96.1	3.65
6 "	738 "	98.4	3.67-
7 "	750 "	100.0	3.63

Exceptions to the above general rule in the case of individual cows can easily be quoted; in fact, many of the cows which have given yields of 20,000 lb. or more in recent years have been cows which, in their record-breaking lactation

period, showed a very material increase in yield, and sometimes also in percentage of fat, over any previous record. The exceptions illustrate the effect that "good management" (by which is meant the bringing into action throughout the same period a number of factors which all tend to increase the yield and quality), more or less accompanied by "forcing," can have in the case of cows which possess great inherent capacity of milk production. The same results could not be obtained with ordinary management under ordinary conditions (this statement must be taken to mean that ordinary management is bad management), and, in spite of exceptions, the general effect of age is as set out above.

7. Climate and Weather Conditions.—Generally speaking, the effects of weather conditions on yield and quality are comparatively slight and of a temporary nature. A change to a decidedly high or a decidedly low temperature tends to reduce the yield of milk, the fat percentage remaining the same, or being even slightly increased. There is also a current belief that during summer a good shower of rain brings about an almost immediate but temporary increase in the milk yield. There is no evidence to show whether this increase is due to the less trying climatic conditions which then obtain, or to the grass being damp, and the cows therefore obtaining a greater quantity of water along with the grass they eat.

Cows kept out of doors during winter are assumed to require slightly more food than those kept indoors in order to maintain the body temperature, but again no experimental results are available on this point. On the other hand, there are numerous results to show that exposure to outdoor conditions (except in cases of severe storms or periods of low temperature) in the south of England does not result in a lower yield. The Harper-Adams experiments of 1901-04 afford interesting evidence on this point, and the experiment carried out by the Highland and Agricultural Society of Scotland on "Effects of Restricted Ventilation and Temperature in Cowsheds on Milk Yield" are also worthy of attention. In the latter experiments during the winter of 1908-09, on five farms in different parts of Scotland, ten similar groups of cows were fed and housed alike, except that the byres containing five groups of cows were freely ventilated in all weathers, whereas in the byres containing the other five groups the ventilation was so restricted that an average of about summer temperature was maintained. The results may be summarised as follows:—

Number of cows	50	. . . . .	50
Average temperature—free venti-		Restricted	
lation	49.8° F.	ventilation .	59.4° F.
Average milk yield per cow daily .	27.5 lb.	. . . . .	27.3 lb.
Average percentage of fat	3.55%	. . . . .	3.49%

The experiment was repeated the following winter, and results confirming the above were obtained. It cannot be doubted that the cows kept under conditions of free ventilation are also likely to be healthier and more resistant to disease than those confined in a shed where ventilation is restricted.

8. *Health of the Cow.*—Any serious illness or injury very soon causes a definite decrease in the milk yield, but it is most probable that the lessened yield of milk contains a percentage of fat much above the average. Milk produced by a sick or seriously injured cow should not be mixed with the remainder of the milk, nor used for food purposes. Cows, however, like all other animals, suffer from "slight indispositions," not serious enough to be called an illness and often lasting only for a day or two, but nevertheless sufficient to affect the percentage of fat in the milk. When testing samples of milk from individual cows at each milking for a period of successive days, the writer has occasionally found a sudden unexplainable increase in the percentage of fat with only a very slight decrease in the yield, yet inquiry or observation the next evening or morning showed that the cow in question was slightly off feed, or otherwise off colour. The "slight indisposition" had been sufficient to affect the fat percentage without affecting the yield of milk. The next day the cow was either back to normal health or definitely worse; if the former, the yield and fat percentage were also normal, and if the latter, the yield fell off considerably. The variation in fat percentage referred to is of no significance so far as the mixed milk of the herd is concerned, but when butter-fat tests are made of the milk of individual cows for the purposes of "advanced registry," "register of merit," or milking trials and butter test results, it is obvious that samples taken under such conditions would not be truly representative of the cow in question. During long-period tests provision can be made for the taking of check samples, but no such remedy exists in the case of one-day milking trials and butter tests.

It is highly probable that the exceptional results obtained from some cows in such tests are due to a "slight indisposition," brought about, accidentally or intentionally, by special feeding under showyard conditions. This aspect of the question will be dealt with again, when the effect of feeding on yield and quality is under consideration.

Influence of Œstrum.—The influence of œstrum or heat may also be considered under health. No general rule can be laid down as to how cows will be affected by this sexual disturbance. Some give a decreased yield with a higher fat percentage; others a decreased yield with a lower fat percentage, followed in both cases by a material increase in the yield for

animal, and if persisted in for a long period until very high condition is attained will tend to reduce the yield of milk. There is also greater risk of indigestion when the ration is definitely in excess of the cow's requirements.

Effect of giving a Balanced Ration.—The effects noted above, due to under-feeding and over-feeding, naturally lead to the conclusion that the aim in the feeding of a dairy herd should be to supply a properly balanced ration. Additional evidence on this point is forthcoming from experimental results in Wales and in the United States, where comparisons were made between a ration which, though typical of many in common use, was defective in respect of the proportions of albuminoids and non-albuminoids, and a ration which was properly balanced. It appears probable that properly balanced rations increase and maintain the milk yield, but do not materially affect the percentage of fat. An increase in the milk yield will, however, increase the total output of fat, and thereby increase the quantity of butter or cheese when the milk is used for the manufacture of these products.

A full consideration of the balance of a ration should also take into account the supply of mineral matter and vitamins. There is some evidence that a deficiency of mineral matter, especially lime and phosphates, will prevent a heavy milker from attaining her maximum production, but the present state of our knowledge on this subject does not permit the drawing of definite conclusions as to what extent the yield and quality of milk may be influenced by a deficiency or excess of mineral matter and vitamins.

Change to Pasture.—The change in feeding which does cause a material change in the quantity and quality of milk is that of turning the cows out to pasture in May. In the Midlands and south of England, and in other parts where it is customary to turn the cows out day and night into abundant succulent pasture, there is almost invariably a notable increase in the milk yield and a decrease in the percentage of fat. As the summer advances the effect of the juicy grass lessens, and by the end of July or the beginning of August the milk yield usually has fallen considerably and the percentage of fat increased. This early summer change in feeding, when associated with unequal hours of milking, makes it a matter of difficulty to maintain the morning's milk above the "standard" fat percentage.

This increase in yield when the cows are first turned out to pasture has long been an accepted occurrence in the seasonal fluctuations of the milk supply, but the opinion is now gaining ground that a great increase in yield at this time is in itself evidence that the ration given during the winter was deficient in quantity or quality. Probably this is largely a question of degree. Even with carefully chosen rations and

liberal feeding a slight increase in yield occurs, though naturally if the cows are turned out in the same pasture by day throughout the winter the grass will be better eaten down, and its effect in stimulating the yield will be spread over a longer time, and will be less noticeable than when cows are turned into a fresh pasture with good herbage; also where the winter ration is less adequate and perhaps badly balanced, the change to grass is more effective in increasing the yield. From such information as the writer possesses, it appears that an increase of some 10 to 20 per cent may be obtained in a well-managed herd, but where the increase is found to exceed 20 to 25 per cent, this should be taken as proving that the ration given previous to turning out to grass was defective, and capable of considerable improvement.

In this connection it should also be remembered that as a rule the price received for milk falls appreciably in April, and the farmer is, therefore, tempted to reduce the allowance of concentrates in the ration for some weeks before the pasture alone becomes capable of supplying a full ration.

Reference was made on page 132 to the effect of turning out cows to grass on the rate of decline of the yield during the lactation period. This effect is illustrated by the following figures showing the yield in gallons and the percentage output of milk for each month of the lactation period in the case of three groups of October calving cows, which were classified according to yield into light milkers (averaging 500 gallons), medium milkers (averaging 700 gallons), and heavy milkers (averaging 950 gallons), and also three groups of April calvers, which, when similarly classified, averaged 540 gallons, 700 gallons, and 885 gallons respectively :—

**COWS CALVING IN OCTOBER: MONTHLY YIELDS DURING
LACTATION PERIOD.**

Group of Cows.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	July.	Aug.	Sept.
Averaging 500 Gallons—												
Gallons	55	84	75	62	56	50	45	42	22	9	..	..
Percentage	11.0	16.7	14.9	12.4	11.2	10.0	9.0	8.4	4.5	1.9	..	..
Averaging 700 Gallons—												
Gallons	55	108	98	85	76	68	66	65	47	27	10	..
Percentage	7.8	15.3	13.3	12.1	10.8	9.8	9.4	9.4	6.7	4.0	1.4	..
Averaging 950 Gallons—												
Gallons	70	180	120	107	97	87	88	95	79	51	26	..
Percentage	7.8	18.7	12.6	11.2	10.3	9.1	9.3	10.0	8.3	5.4	2.8	..

COWS CALVING IN APRIL: MONTHLY YIELDS DURING LACTATION PERIOD.

Group of Cows.	Apr.	May.	Jun.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Averaging 540 Gallons—												
Gallons . . .	64	103	90	78	68	55	40	25	13	6	..	..
Percentage . . .	12.1	17.3	15.3	12.9	11.8	10.3	8.5	6.1	3.8	1.9	..	..
Averaging 700 Gallons—												
Gallons . . .	85	121	105	91	83	72	60	43	27	14	..	..
Percentage . . .	11.7	19.0	16.6	14.4	12.6	10.2	7.4	4.6	2.4	1.1	..	..
Averaging 885 Gallons—												
Gallons . . .	88	153	132	115	105	92	76	57	39	20	8	..
Percentage . . .	10.7	17.3	15.1	13.1	11.9	10.5	8.6	6.5	3.8	2.3	0.9	..

An examination of the above results shows that April calvers attain higher daily and monthly yields after calving than cows of similar capacity which calve in October; that October calvers maintain their yield better than April calvers; that October calvers giving high yields show greater response to early summer grass than those giving low yields, probably because the latter are too near dry to respond to good grazing.

Temporary Effects of Changes in Feeding.—Other foods, such as wet brewers' grains, large quantities of roots, and certain concentrates, have from time to time been credited with increasing the yield of milk, and some increase has often been obtained when the introduction or increase of such foods has made the ration more suitable for milk production. With regard to the percentage of fat, the effect of such changes is only temporary, and the rise and fall is represented by the following average results:—

1st week. Increase in Fat.	2nd week. Increase in Fat.	3rd week. Decrease in Fat.	4th week. Decrease in Fat.	5th week. Decrease in Fat.
.09%	.08%	.06%	.05%	.06%
Increase .17%		Decrease .17%		

It is no doubt true that even the slight increase in the percentage of fat indicated above may be at times a relief to the seller of milk, and the fact that after a change in feeding the quality may be observed more closely than usual for a

week or two has led to the current beliefs on this point; also observation usually ceases after a week or two, and the subsequent decline to normal takes place unnoticed. Some recent investigations indicate that certain oils and oily foods, when given to cows, appear to cause a decrease in the percentage of fat, but further experimental work is necessary before any authoritative statement can be made.

(b) *Effect on the Milk of Single Cows.*—The possibility of affecting the quality and quantity of the milk of individual cows is of greatest importance in the management of animals likely to give record yields, and during short-time milking trials and butter tests. The subject is divided naturally into two parts: (1) the feeding of the cow before calving, and (2) the feeding of the cow after calving.

Feeding before Calving.—There is now an increasing amount of experimental evidence, chiefly of American origin, to the effect that the condition of a cow at calving time has a direct influence on the yield and quality of milk for some weeks after calving. In brief, a cow in first-class condition will give both more and richer milk than the same cow if in lean condition. Heavy feeding during a prolonged dry period provides a naturally good cow with reserves of fat, which, after calving, are gradually worked off in the milk. The length of time during which this reserve will affect the yield and quality appears to depend on the kind of feeding before and after calving. In American publications on this subject the preparation of a cow is described as “fitting” her for the subsequent milking period, and two kinds of fitting are recognised—“soft fitting” and “hard fitting.” Soft fitting means so feeding the cow that she accumulates a store of soft fat which will pass off fairly rapidly after calving. A ration containing a good proportion of starchy and oily foods is used, but a due amount of albuminoids is also given. This soft fitting is considered of special advantage in preparation for the “three-day” and “seven-day” tests which were at one time so popular in America. Hard fitting means preparation for a twelve months’ milking period, and requires a ration with a larger proportion of albuminoids than in the previous case; also the period of hard fitting before calving must be longer. In addition to an adequate supply of fat and flesh-forming foods, care is taken that the mineral reserves of the body are also built up.

The following results were obtained by an American investigator from one cow under his own observation and management, and are very interesting in this connection:—

Cow No. 207.

1908. Condition—rather lean.			1910. Condition—Fat, weighing 200 lb. more than in 1908.	
Days after Calving	Daily Yield.	Per cent Fat.	Daily Yield.	Per cent Fat.
3	..	..	..	5.68
4	..	..	57.2	5.35
5	..	..	53.1	4.81
6	69.0	2.8	58.7	4.13
7	59.0	2.4	60.0	4.34
8	68.5	3.9	65.8	4.16
9	65.8	3.5	64.2	3.87
10	70.8	2.8	67.3	3.89
11	74.1	2.6	74.7	3.63
12	67.8	3.1	79.4	3.28
13	69.3	2.7	88.2	3.11
14	83.5	3.03	84.5	2.85
15	81.9	2.65	88.0	3.20
16	80.4	2.69	90.5	3.00
17	77.4	2.80	93.9	2.80
Average for year		2.80	2.76	

The above figures show both a higher daily yield and a higher fat percentage for a short time after calving when the cow calved down in a fat condition. It is also reported that in 1910, soon after calving, this cow made an advanced registry seven-day official record of 4.09 per cent fat.

Feeding after Calving.—In addition to the increase in yield and quality which follows when good milking cows calve down in high condition, it apparently is also possible at times to increase the percentage of fat by special feeding or changes in the diet after calving. The object of these changes is to increase the transference of fat from the body to the milk without causing any decrease in the yield of milk. It is doubtful if any definite procedure can be laid down which will always give the same result with different cows. An appreciable increase in the proportion of albuminoids in the ration, a decrease in the total amount of the ration for a day or two, the withholding of water and the use of additional rugs (causing sweating), are all devices which have been

used from time to time with a view to stimulating the transference of fat from the body to the milk; but most probably a preliminary trial is necessary before it can be known how an individual cow will react to specific treatment. It is interesting to note that the direct feeding of oil or fat to cows does not cause an increase in the fat in the milk; in several experiments $\frac{1}{2}$ lb. or more of fat or oil (such as earthenut oil, coconut butter, cod-liver oil, cotton-seed oil, palm-kernel oil, and soya-bean oil) has been given per head daily without causing any increase in the fat percentage. It is apparently easier to cause a transference of fat from the body to the milk than to bring about an increase in fat percentage directly from the foods given.

Abnormal Results.—It is obvious that where the above or similar conditions of management and feeding prevail, the yield of milk, and particularly the percentage of fat therein, is specially influenced, and is not necessarily indicative of the normal capacity of the cow. The following results of butter-fat tests for seven-day periods and complete lactation periods of the same cows have recently been published in the United States :—

Cow.	Seven-Day Periods.	Complete Lactation Periods.
	Per cent fat.	Per cent fat.
A	4.02	3.35
B	4.21	3.33
C	3.92	3.45
D	4.32	3.72
E	4.50	3.23
F	4.30	3.64
G	4.01	3.54
H	4.22	3.71
I	4.64	3.36
J	4.51	3.44
Averages	4.26	3.47

The publication of results such as the above has greatly lessened the popularity and value for sale purposes of the short-time tests in the United States, and rightly so. In this country the only short-time tests are those of the different shows, and the results of such tests are of very doubtful value as indications of a dairy cow's true output. In addition to the possibility of the specific conditions discussed above affecting the results, there is also the disturbing conditions

of the journey from home and the unusual housing accommodation of the showyard. Further, owing to the possibility of variation, the results of single tests from a cow are of little or no value as an indication of the normal or natural percentage of fat in a cow's milk. The only result of any value is one based on the true average of a number of tests made at different times during the lactation period. Some Breed Societies and some Milk-Recording Societies provide such facilities for their members, but there is need for a unification of method throughout the country, so that reliable results can be obtained for the advantage of breeder, buyer, and seller alike.

The Use of Drugs.—Two other aspects of the question of feeding in relation to milk yield and quality remain to be briefly referred to. The first is the possibility of the use of drugs (the so-called galactagogues) to increase temporarily the yield or percentage of fat in milk. This subject has been investigated by several workers, and the results have been somewhat conflicting. The drugs used were alcohol, ginger, malt extract, sodium bicarbonate, aloes, pituitin, &c., and it was not found that any drug could be relied on to cause an increase in the yield of milk or in the percentage of fat, while some definitely decreased both yield and percentage.

Effect of Foods on Colour and Consistency of Butter.—The remaining point is that of the effect of foods on other qualities of milk, such as the colour and consistency of the butter fat—matters of very practical importance to the butter-maker. As to colour, this is due chiefly to the pigment *carotin*, which is present in green grass and herbage, unbleached or unwashed hay, carrots, kale, &c., and is very rapidly transferred from the food to the milk fat globules, hence also to the cream and butter. The consistency of butter is well known to be influenced by the foods given. Such foods as fresh grass, roots, linseed cake, and earlnut cake tend to give a soft greasy butter; whereas other foods, such as bean and pea-meal, cotton cakes, and coconut cakes, tend to give a hard and white butter.

GENETICS IN RELATION TO LIVESTOCK BREEDING.

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THE science of genetics (which means literally the science of being born or of the coming into being of an individual) seeks to account for the similarities and dissimilarities in characterisation exhibited by individuals related by a common ancestry, and to define the exact relation between successive generations. It deals with the physiology of heredity, the mechanism by which resemblance between parent and offspring is conserved and transmitted, and with the origin and significance of variation, the mechanism by which such resemblance is modified and transformed. It seeks to define the manner in which the hereditary characters of the individual are represented in the fertilised egg in which the individual has its beginning, and to demonstrate the way in which these characters become expressed as the development of the individual proceeds. Stockbreeding is a craft which is concerned with the maintenance of the desirable qualities of a stock, with the improvement of these qualities, and with the elimination through breeding of qualities which are held to be undesirable, generation by generation. Since the stockbreeder deals with characters that are known to be transmitted from one generation to another by some mechanism, it is essential for intelligent breeding that there should be a knowledge of the manner in which these characters arise in a stock, are lost, or are modified. The problems of the geneticist and of the stockbreeder are identical, though their interests are dissimilar.

As would be expected, the geneticist has studied those characters the hereditary transmission of which promised to be comparatively straightforward, and the materials he has used have been, among animals, the inexpensive, quickly-maturing, very highly-fertile forms such as the mouse, rat, guinea-pig, rabbit, and above all the fruit-fly, *Drosophila*. But out of this work, with material that in the opinion of the stockbreeder would not be regarded as real animals at all, results have been obtained which have provided interpretations and theories that, there is every reason to believe, can

account for the phenomena of hereditary transmission encountered in the course of practical stockbreeding. Out of this work one fundamental conception has emerged. The hereditary constitution of the individual, established at the time of the fertilisation of the ovum by the sperm, decides in the great part the future characterisation of the individual.

The science has known great extensions during the last twenty years, and it has been assumed at times that coincident with this advance in our knowledge of the fundamental laws of heredity there has been an equal and parallel advance in the craft of breeding. This is not so, for the simple reason that the craft is still far in advance of the science: much more is known of the craft of breeding than of the science. The principles of heredity were in operation long before they were disclosed by the scientist, and there can be no doubt that the success of the great "improvers," of the makers of the modern breeds, was achieved by practices that were essentially in accord with these principles.

Advance in our knowledge of the hereditary phenomena was rendered possible by the birth of the new conception that the individual as a whole was not the unit in inheritance, but could be regarded as a definite orderly combination of independently heritable units. For the first time it became possible to appreciate the fact that, for example, the difference between red and black coat colours in Aberdeen-Angus cattle depended fundamentally on the same causes as in the Galloway, Kerry, or Dexter. There was no longer a peculiar Aberdeen-Angus black or Galloway black or Kerry black, differing among themselves and also in relation to their respective reds, but there was a black and a red commonly possessed by many breeds of cattle. Breed was now interpreted as signifying different combinations of unit or independently heritable characters all drawn from the common source of the stock in which modern domesticated cattle had their origin, just as different arrangements and combinations of letters make different words, though all words are made up of letters derived from a common source—the alphabet.

The breeder has employed the methods of hybridisation and inbreeding associated with selection in the creation of the modern breeds. He has practised inbreeding with selection in order that the desired characters of his stock may be maintained and improved, and he has sought hybrid vigour in outcrossing. The geneticist has employed these very methods in order to explore the hereditary constitution of the living animal. These are the very tools with which he has carved out of his experiences the modern theory of heredity. By the use of these methods the geneticist has been analysing his material into its independently heritable characters; he has dissected by breeding the individual into its

hereditary units, just as the anatomist has dissected the body into its constituent parts, and has shown the relationship of part to part and of each to the whole. The method of genetics then is character-analysis. The object of the breeder is character-synthesis. There is no need to stress the fact that there should be complete analysis before synthesis is undertaken.

As was inevitable with increase of knowledge of the phenomena of heredity and of variation, it quickly became evident that instead of the hereditary mechanism being a simple affair, as was first thought, it was one of the most complicated. It also became evident that genetical knowledge cannot always be applied to a business. For example, in order that the facts of inheritance may be disclosed in a clear-cut way, it is necessary to raise large numbers of individuals, and this is not always possible in the case of the larger domesticated stock. Again, it has been shown that animals which look exactly alike may be remarkably different in their hereditary constitution, and that the only method of demonstrating this difference is to use them for the raising of further generations. Among the more slowly-maturing domesticated stock such a test as this is only possible in exceptional circumstances. It is a far more difficult task to improve the highly-developed breeds of to-day than to improve the scrub. The geneticist can play a most important rôle in a country in which the livestock has not been improved: it is difficult for him to do so here, where the breeder is so skilled a craftsman. Bakewell, Booth, Bates, Cruickshank, and Watson were dealing with the facts of heredity and variation just as are the breeders of to-day. Their methods, which in the end were used to a very large extent, were those which would be employed by the geneticist who set himself the problem of making a new breed or of improving an old one. But to-day in this country the cost of launching a new breed or of drastically changing an already established one would be prohibitive, owing to the economic value of the individual animals, because of the length of time necessary to fix the new types, because the already existing breeds, although exhibiting many qualities that are not wholly desirable, are in the main exceptionally good, because they are so valuable economically, and because it is impossible easily to compete with the traditions which these breeds have gathered around themselves. Experimental breeding with highly-improved modern stock animals is far too expensive to be undertaken lightly, and there can be no question that it is embarrassed by the well-established pedigree system. It is a fact that it is more profitable to produce specimens of an established breed than to create anything new, because, as definitions go, anything new produced by the methods of hybridisation cannot be pure-bred,

and therefore cannot command the price of a pedigreed animal. It is difficult in this country for the geneticist to play any great rôle in drastic breed improvement because of the economic factors involved. There have been hundreds of new varieties of agricultural plants developed within recent times, but in the case of animals the position of the already established breeds has been unassailed. Livestock to-day is very much what it was when genetics as a science came into being, whereas in the case of agricultural plants the varieties that were popular twenty years ago are now almost entirely replaced by newly-established ones. Genetical methods have played a very important part in the founding of these new varieties of plants because of the cheapness of the material, the relative simplicity of their hereditary constitution, the ease with which they can be manipulated, and because any new variety is welcomed and is judged upon its own merits. The plant breeder is essentially an individualist, whereas the animal breeder depends to a very large extent upon the assistance of his colleagues within the breed society to maintain the market for his products, and the moment he undertakes the establishment of a new breed, or the combination, by cross-breeding, of valuable characters possessed by different breeds, he has to face the economic problem of diminishing returns. Until he can make his new creation "pure-bred," it cannot compete with the already established, and he has to consider the financial value of his end-result in relation to the cost of establishing it; and since it is really impossible to anticipate the exact value of the end-result, the making of it must remain a hazardous adventure.

From what has been said it would seem that it is to be expected that the science of genetics cannot play any prominent part in stockbreeding endeavour in this country. That this is not so will now be shown. It cannot be gainsaid that a knowledge of the phenomena of heredity and variation in the domesticated animals *must* be of considerable value in the education of the stockbreeder, and *may* be applicable in the practice of breeding. The great service to the breeder that the science of genetics offers to-day is that it provides an interpretation of his methods and of his results, enabling him to discard all unessential steps in his practices, and to proceed confidently and more directly to his goal; to plan the steps of a breeding operation with certainty and with precision. The science of genetics has rendered a service of the greatest value to the breeder by introducing into breeding practices a new point of view, which undoubtedly must have far more beneficial effects than could any new method of breeding that might be devised. It has been shown that the individual is not a unit in inheritance, but that specific characters or groups of characters that distinguish animal from

animal, breed from breed, are inherited independently. It has shown the way in which a character can be taken wherever it may be found and transferred and fixed. It has furnished a critical appreciation of the value of selection, and demonstrated that this is not a creative process, but is merely one of sorting out from amongst a mixture of heritable characters already present in a stock. It has given an exact meaning to the phenomena of inbreeding, outbreeding, and prepotency. It has demonstrated beyond doubt that certain abnormalities and diseases are truly heritable, and has shown the way in which they may be prevented. It has shown that such characters as fecundity, fertility, and longevity have a definite hereditary basis. It has probed the mysteries of sex-determination, and is promising a solution. It has given to purity and to hybridity an exact meaning, and has perfected the methods by which any character, structural or functional, which is shown to be hereditary, can be subjected to genetical analysis and made available for incorporation into a breed.

It cannot be held to-day that to be a successful breeder of pedigreed stock a man must have a thorough knowledge of the science of genetics. It can be maintained, however, that the science of genetics has much to offer to the breeder, and that if opportunities are given to the geneticist, much will be added to the knowledge available for application to breeding practices. It should not be forgotten that in his relationship to the practical breeder the geneticist is in rather a different position to his colleagues in the fields of nutrition and disease; for while they are using methods which are altogether outside the experiences of the layman, who is therefore naturally prepared to accept their statements of fact and opinion without comment, the geneticist is using just the same methods and the same material as the breeder. Breeders, realising quite clearly what they and their predecessors have done without any help from the geneticist, are not readily inclined to accept suggestions when those deal with matters that they have had to study in so practical a fashion all their lives. This attitude can be readily understood. Nevertheless it must prevent intimate co-operation between geneticist and breeder, and there are plentiful indications that such a co-operation is becoming necessary. The business of the geneticist in his relation to the stockbreeding community is to undertake a complete character-analysis of farm stock; to investigate and define the biological significance of the different characters and of their variation in their relation to the living animal; and to examine breeding practices in the light of genetical knowledge. In answer to any request for information, the geneticist can give but one of two answers: (1) that such information having been thoroughly verified is available, or (2) that knowledge concerning

this matter is not sufficient to warrant an answer being given. He would submit that there are no mysteries about animal breeding, but only two categories of phenomena—those which can be explained in the light of what is known, and those which cannot be so explained until more knowledge concerning them has been acquired. The second category unfortunately includes practically everything that relates to animal breeding, and the geneticist, pursuing knowledge for its own sake, can as yet give no better explanation of them than can the breeder of experience. However, it is his business to reinforce the first category at the expense of the second.

In order to illustrate the rôle of genetics in agricultural endeavour, it is proposed to answer certain questions which have been asked.

What is the significance of the appearance of a red calf in a herd in which the fashionable coat colour is black, and in which all red animals are eliminated? Is the prejudice against red coat colour justified on biological grounds?

Black and red coat colours in cattle constitute a typical pair of Mendelian characters, black being the dominant and red being the recessive member of the pair. A red calf can only be produced by black parents when both of these are heterozygous in respect of their coat colour character. Every calf, male or female, black or red, has its origin in the union of an ovum, the reproductive cell or gamete elaborated by the maternal parent, and a sperm elaborated by the male. It is impossible on examination of the recently-fertilised ovum or zygote to predict the future characterisation of the individual which arises therefrom. It is impossible to distinguish between a fertilised egg which will at the end of its development be a black individual from one which will be a red, and yet the first inevitably becomes a black and the other inevitably becomes a red. Characterisation is expressed as development proceeds. It is assumed that for all the hereditary characters that are exhibited by an individual there are corresponding determiners or factors in the fertilised egg, brought therein by the gametes, the egg and the sperm, at the time of fertilisation. For the character black coat colour there is thus a determiner or factor. This factor may be present in the zygote in the duplicate state, having been conveyed therein by both egg and sperm. When the factor for black is present in the duplex state the individual that arises from that zygote is spoken of as being homozygous for the character black coat colour. On the other hand, into the zygote there may have been brought a factor for black from one parent and a factor for red, the alternative character, from the other parent. Under these circumstances, for reasons that are not yet

known, of these two factors, that for black and that for red, it is the former alone that determines what the coat colour shall be. Black is said to be dominant in its relation to red. Such an individual will be heterozygous for its coat colour character. Homozygous and heterozygous blacks will be indistinguishable on inspection. If two heterozygous blacks are mated, there will occur on the average in every four 3 black calves to 1 red. To explain this 3 : 1 ratio it is assumed that half of both male and female gametes elaborated by such heterozygous individuals carry the factor for the dominant character black, and the other half the factor for the alternative recessive red, and the two sorts of egg and of sperm occur in equal numbers. It is assumed also that the factor for the dominant is not adulterated in any way by its association with the factor for the recessive. If it is assumed that for every pair of factors that correspond to a pair of characters, only one can pass into the ripe gamete, it follows that a 3 : 1 ratio in the next generation will be obtained, and of the individuals exhibiting the dominant character one will be homozygous for that character and two heterozygous, whilst the individual exhibiting the recessive character must of necessity carry the factor for that character in the duplex state, since if in its hereditary constitution it carried a factor for the dominant, it would exhibit the dominant character. It is possible by examining the records of the coat colours of the offspring to define the hereditary constitution of the parent in respect of the coat colours black and red. The following matings are possible :—

Homozygous black to homozygous black will give none but blacks, all homozygous.

Homozygous black to heterozygous black will give all blacks, of which 50 per cent will be homozygous and 50 per cent heterozygous.

Homozygous black to red will give all heterozygous blacks.

Heterozygous black to heterozygous black will give 25 per cent homozygous blacks, 50 per cent heterozygous blacks, and 25 per cent reds.

Heterozygous black to red will give 50 per cent heterozygous blacks and 50 per cent reds.

Red to red will give all reds, of necessity homozygous.

The only mating of blacks that can yield a red calf is that of two individuals heterozygous in respect of this coat colour character.

Purity can now be given an exact meaning. The coat colour character has to be considered quite apart from all the rest of the characters that in their association make the animal what it is. An individual is a pure black when it is

homozygous in respect of this character, when in its hereditary constitution the determiner or factor for this character is present in the duplex state, having been received from both its parents.

The occasional appearance of a red calf in an Aberdeen-Angus herd, or Galloway, Holstein, Kerry, or Dexter, can be accounted for if it can be shown that at some time during the formative period in the history of these breeds a red individual was employed. This unfortunately is not always possible, for the earlier part of the history of most breeds is not accurately recorded. From what is known of the behaviour of these coat colour characters, however, it is perfectly legitimate to postulate that the appearance of a red calf in a black herd is a sure indication that at some time or other a red animal was used, probably at a time when coat colour was a matter of no great concern. If red was introduced, and if black was chosen later as the standard coat colour, red would only exceptionally be seen, because, as has been said, black is dominant to red, and homozygous and heterozygous black are indistinguishable on inspection. If there exist in a stock a male and a female which are heterozygous blacks, sooner or later the appearance of a red calf is inevitable.

There have been red Aberdeen-Angus herds, and, as far as is known, a red Angus is as typical a specimen of the breed as is a black. A red is homozygous for this coat colour character, and it certainly is as pure-bred and as pure breeding as a black, and there is no critical evidence that suggests that it is not as valuable as its black relative. The elimination of the red is a matter of no great importance in the case of the beef breeds, but it is a most reprehensible state of affairs that in the milk breeds a potentially most valuable specimen should be disposed of merely because it happens to be born with an unfashionable coat colour. There is no reason whatsoever for suggesting that a Holstein-Friesian is not so good a Holstein-Friesian biologically because its coat colour is red-and-white instead of black-and-white, yet a red-and-white is not eligible for registration in the American herd-book. It is a fact that up to about 1859, before the importation of black-and-white Jutlands, the majority of Holstein-Friesians were red-and-whites; in Holland red-and-whites are eligible for registration, and are relatively common. Since it has not been shown that an animal with a red coat colour is less valuable as a producer than a black-and-white, there is no biological justification for the elimination of what merely is unfashionable. It may be expected that a more liberal-minded attitude shall follow a spread of knowledge, and that a red-and-white calf will not be slaughtered, but will be disposed of to a dairy farmer, to whom colour is a matter of quite

secondary importance. Fashionable standards are not always true reflections of economic values.

Why is it impossible to breed a true-breeding roan ?

Dominance, such as that of black over red, is an unessential feature of Mendelian inheritance. What is essential is the orderly reappearance of the characters of the parents of the hybrid (the heterozygous black in this case), and the hybrid itself is the second crossbred generation in definite numerical proportions. The red roan behaves as though it were a hybrid in respect of coat colour thrown by a red and a white. A similar case is that of the blue roan, which is the hybrid produced by a black and a white mating. Roan by roan gives on the average in every four 1 red, 2 roan, and 1 white. This 1 : 2 : 1 ratio is reminiscent of the ratio in the second crossbred generation of the black : red mating in which 1 homozygous black, 2 heterozygous blacks, and 1 red are obtained, and the difference between the two cases is merely a matter of the degree of dominance. Roan may be regarded as a compromise between red and white, neither of these being dominant in relation to the other. If this explanation is a satisfactory one, the following results may be expected :—

Red by red will give none but reds.

Red by white will give none but roans.

Red by roan should give equal numbers of reds and roans.

Roan by white should give equal numbers of roans and whites.

Roan by roan should give 25 per cent reds, 50 per cent roans, 25 per cent whites.

White by white should give none but whites.

These are the results usually obtained, and the explanation is satisfactory in the great majority of cases. It is a sound working hypothesis. Exceptional coat colours are sometimes obtained, however, in one or other of the above matings. It must be remembered that this analysis is not based upon results of critical experiment. It is based upon data obtained from the herd-books and breed registers, and it can be stated at once that the records are not in all cases trustworthy. What one breeder would call roan another might call red-and-white, and so on. It is possible that all Shorthorns are red animals fundamentally, but that in their different hereditary constitutions there may be factors of two sorts, and in different combinations : (1) some that determine that the pigment shall be restricted to certain parts of the body ; and (2) others that determine that the pigment shall be restricted in its distribution among the hairs, so that it is possible to get an

animal with a white ground and patches of red or of roan or a red animal with patches of roan. Be this as it may, it is impossible to give an absolutely trustworthy interpretation of the significance of roan until controlled experimentation has been undertaken. In the meantime it is enough to regard the roan as being heterozygous for its coat colour character, and therefore incapable of breeding true.

It is a matter of interest to note that the blue-grey has, since the first quarter of the nineteenth century, been held to possess many desirable qualities to an exceptional degree—vigour and rapid growth, for example. Now the blue-grey in those days was always the cross-bred offspring of a Galloway or an Angus and a Shorthorn. It is well known that the first cross out of two pure-bred and dissimilar parents exhibits to a remarkable degree what is known as hybrid vigour, and this hybrid vigour came to be regarded as a peculiar virtue of the blue roan and invariably associated with this colour. This first cross is heterozygous not only for its coat colour character but also for the very considerable number of characters in respect of which its parents differed. Hybrid vigour is not inevitably associated with a roan coat colour. It may be expected that a roan which is the first cross-bred out of a red and a white, its parents not being related or only distantly so, will exhibit the qualities of hybrid vigour. It will do so, however, not because it is a roan but because it is heterozygous for many other characters besides its coat colour.

Is high milk yield a heritable character, and has its mode of inheritance yet been demonstrated?

The conclusion that inheritance accounts for practically all of the permanence in the milk production of a cow from one lactation to another is justified. It is established that the size of the cow is partially responsible for her milk yield, and that size is inherited in the same way as other body characters. It has been shown that conformation plays only a minor part in determining the milk production of a cow at any age. Conformation has no relation to the butter-fat percentage a cow is able to give in her milk. It is known that both sire and dam influence the production of the offspring, and also that butter-fat percentage is controlled in the inheritance by a series of factors. High milk yield appears to be incompletely dominant to low milk yield, and the factors for high milk yield can be transmitted by the male. The study of the inheritance of such a character as high milk yield is one of the most difficult a geneticist can be asked to tackle. Differences in husbandry, differences in climatic conditions, ill-health, all tend to confound genetical analysis. If a cow is a homozygous black, she will be black no matter what

circumstances attend her development, but it is not inevitable that a cow which has these multiple factors for high milk yield in her hereditary constitution shall express the character which is based upon these factors. In fact, her record may be such as to completely deny her breeding. Environmental circumstances can condition the expression of the factorial constitution of the animal. The best breed of animals will not excel in performance if the husbandry is wrong.

What is the significance of kemp in the fleece of the mountain sheep?

The answer to this cannot yet be given. It is not sufficient to devise a method of breeding by which the proportion of kemp can be reduced—the significance of kemp in the life-history of the sheep, and especially its supposed relation to hardiness, has to be considered. A complete examination of the various constituents and qualities of the fleece must be made. The fleece has to be examined from the point of view of the breeder, of the manufacturer, and of the biologist, and at all times during the life-history of the individual. It is necessary to demonstrate the significance of each individual characteristic, and to demonstrate its mode of inheritance, to seek evidence of clear correlation, between such characters as shortness, fineness, and density. Correlations must also be worked out between the kemp content and other qualities possessed by the sheep. The whole question is not so much one of drastic improvement or the creation of a new breed as the analysis of the breeder's material, so that he will be enabled to know beforehand the probable result of any change in his standards and of the quickest way of securing any such change. He will be able to make these changes with the minimum of risk, and to proceed with certainty.

Are the pedigree system at present in vogue and the advanced registry system practices in accordance with established genetical principles?

The effort to obtain some method by which the breeding performance of an animal can be gauged in advance has resulted in the pedigree system, which is based upon a recognition of the facts of heredity. The superior animal descended from a long line of superior animals will be more likely to beget superior offspring than will another animal equally good but of mixed ancestry. The chances are that the former will possess the factors for the desirable characters in the duplex state; that the latter will have them in the simplex state: that the former will be homozygous for these characters;

that the latter heterozygous : that the former will breed true to these characters ; and that the latter will not. The pedigree system, while it is being of great use in breed improvement, has not been altogether free from abuses, and a knowledge of the biological principles on which it is based cannot fail to be of value in the cultivation of a sense of proportion in this matter. It is known, for example, that for all practical purposes the inheritance from sire and dam is not far from equality, and the same remark applies to each generation. The "family name" is a useful system of pedigree so long as it is realised that the direct maternal line possesses no special importance, and is of no more value than any other portion of the pedigree.

Of late years the progeny test has received more and more attention, and appears to be worthy of the greatest possible encouragement. In conjunction with a rational pedigree system and a system of line breeding it gives as much certainty in breeding methods as can be expected. It is possible to gain an idea of the factorial constitution of the parents from a review of the characterisation of their offspring ; this is true not only of the structural characters but also of the functional. However, it is much more difficult to identify the latter ; the use of the eye or the calipers is often far simpler than that of the milk-pail.

How is it that sometimes the results of inbreeding are disastrous whereas in other cases there follows definite advance ?

The evidence that is to be obtained from the study of the modern breeds of domesticated stock during their formative periods shows plainly that some degree of narrow breeding is an essential to the attainment of outstanding success in animal breeding. Inbreeding is, therefore, not necessarily harmful but can be definitely advantageous, leading to the development of a uniform and true breeding stock. It is true, however, that benefit does not always follow the practice of inbreeding, for in certain cases there is disappointing regression, diminution of vigour, lowered powers of resistance, decreased fertility, even reduction in size. A critical examination of the situation shows quite conclusively that the effects of inbreeding depend not upon any pernicious attribute of this method of breeding, but upon the genetic constitution of the individuals concerned. Inbreeding has but one demonstrable effect upon the individuals subjected to this action, and this is the isolation of homozygous types. The ordinary specimen of the domesticated animals exhibits a great multitude of characters, and corresponding to these characters there are factors which may be in the simplex or the duplex state. It may be safely said that no animal is homozygous for all the characters

that it exhibits. In point of fact, the ordinary animal is homozygous for but a very few of the characters which it exhibits. Inbreeding leads to a rapid increase in homozygosity, and when this state has been achieved stability and uniformity will be reached, but as this process proceeds there is a reshuffling of all factors, and individuals will appear which are homozygous for characters which are definitely deleterious to their possessor. The weak, sterile, and abnormal individuals which appear amongst the offspring of an inbred line are but the individuals which have received during this process the factors for undesirable characters in the duplex state, and whilst these become eliminated there will be, on the other hand, individuals which, thanks to this process, now come to possess the factors for desirable characters in the duplex state—for such characters as fertility, longevity, early maturity, and so on,—and rigorous selection from amongst these types will isolate strains which will compare very favourably indeed with the original stock. Consanguinity in itself is not a bar to a mating. If inbreeding results in disappointment, all that has happened is that recessive disadvantageous characters previously hidden have been brought to light. Inbreeding in this way purifies a stock. The process may be disastrously expensive if the ingredients of hereditary combinations which will result in undesirable or non-viable types pre-exist, but, on the other hand, those individuals which have been made homozygous for the desirable characters will be far more valuable material in the hands of the breeder than the stock with which he started, for in virtue of their hereditary constitution they must now breed true for those desirable characters.

What exactly is hybrid vigour?

Hybrid vigour, usually most clearly demonstrated by increase in size and in the earlier attainment of sexual maturity, is the property of the first cross-bred generation out of the mating of two dissimilar pure-bred parental stocks. Hybrid vigour is an indication of heterozygosis. In order to secure it, the two parental breeds should be, within reason, as dissimilar in their characterisation as possible and homozygous for the characters they exhibit. If this is so, it follows that their factorial constitutions must be correspondingly different, and in the pooling of their factorial constitutions there will be a very considerable degree of heterozygosis in the first cross-bred offspring: the desirable characters are pooled, and in respect of those characters exhibited by the two parents the offspring will be heterozygous. If the first crosses which exhibit this hybrid vigour so markedly are interbred, the heterozygosis will become diminished, and their offspring will

not exhibit this vigour to the same extent. It is not a sound commercial proposition to pursue hybrid vigour further than the first cross-bred generation yielded by the mating of two dissimilar, more or less closely line-bred parental stocks.

How is prepotency to be explained?

If a certain character is dominant, then its possessor will prove to be prepotent when mated with individuals exhibiting the corresponding recessive. Further, when mated with reds, a homozygous black Aberdeen-Angus will be completely prepotent, whereas an individual heterozygous for the same dominant character will only be partially so. This explanation, though satisfactory in the simplest cases, cannot possibly explain all the facts of prepotency. As yet, however, very little more relating to this established phenomenon is known. Bearing upon this subject is the phenomenon known as nicking. Two individuals not remarkable in themselves beget superior offspring. This fact can be explained on the assumption that the mating brings together the chance association of factors which are complementary or supplementary, and that these in conjunction determine characters that are greatly esteemed.

If selection is not a creative process, how are the results ascribed to this practice by the breeder to be explained?

Selection undoubtedly has been one of the greatest agencies in the permanent improvement of domestic stock. Breeders have always bred the best to the best. They have selected the characterisation that appealed to them most. To-day this selection by characterisation has given place rapidly to selection by factorial constitution. The sire of the milking herd is judged by the performance of his daughters; his potential value is estimated from a consideration of the performance of his ancestors; so also in the mating of other kinds of stock. The individual is judged by the characterisation of his descendants, and his qualities are estimated in advance by the characterisation of his ancestors. The aim of selection is the isolation of individuals homozygous for the desirable characters. Selection does not in any way change the hereditary constitution of a stock. It merely chooses out of the stock those individuals which are becoming homozygous for those characters for which the breeder is aiming. It alters the average characterisation of a stock by altering the proportions of the different classes within it.

Is twinning a hereditary character?

It is possible by the selection for mating of individuals which themselves are twins to build up a stock in which

twinning is the rule. Twinning, of course, demands that at one and the same time there shall be more than one ovum available for fertilisation at the time of service, and hereditary basis of twinning must, therefore, take the form of habitual extrusion of more than one ovum from the ovary during the period of heat. The question as to whether it is desirable to develop a stock homozygous for this character is not a problem in genetics but in husbandry. It is easier to give birth to twins than to rear them in many kinds of environment. It should be mentioned in connection with this subject that it has to be recognised that the conditions of husbandry in the broadest sense condition the expression of this character. A ewe may be homozygous for this character, but whether she will exhibit it depends on many things—on climatic conditions, on the abundance and kind of food, and so forth. The effects of flushing upon fertility in the sheep show how the quality and quantity of nutriment condition the character of fertility. In an entirely suitable country it is possible to develop a flock of sheep that habitually give twins, and, moreover, it is possible by the same methods of breeding to equip the ewes with extra mammary glands.

How is it that every calf is either a male or else a female? How is it that more or less equal numbers of males and females are born? What is the significance of the free-martin?

A male can be distinguished from a female not only by external appearances and by differences in the architecture of the reproductive system, but also by differences in the organisation of the cells of which their bodies are composed. A cell, any cell, consists essentially of a vesicular spherical body, the nucleus, lying in a viscous substance, the cytoplasm. The nucleus of the resting cell appears in stained microscopic preparations as a vesicle containing a network of delicate threads, upon which are borne, like beads upon a tangled skein, minute masses of a deeply-staining material known as chromatin. As the cell proceeds to divide into two, and it will be remembered that the whole of the body of any individual is built up entirely of cells that have been produced by the division of the zygote, it is seen that this tangled mass of fine threads resolves itself into a constant number of filaments of definite shape, and that these become progressively shorter to assume the form of stout rods known as chromosomes. The number of chromosomes is usually some multiple of two, and is constant and characteristic of the species to which the individual belongs.

The gametes, egg and sperm respectively, differ remarkably in size and form, but they are alike in that each contains half the number of chromosomes that is characteristic of the

body of the individual that elaborates them. If, for example, the characteristic number of chromosomes in the cells of the body generally, and in the unripe gametes is 36, then in the ripe gamete elaborated by such individual there would be but 18. Examination of cases in which there are few chromosomes, and in which these are of different sizes and shapes, has made it perfectly clear that they are present in the body cells and unripe gametes in pairs, and that of each pair one member passes into the ripe gamete. When gamete unites with gamete in fertilisation, the characteristic number is restored, and in the case of each pair one member is derived from one parent, the other from the other. In the distribution of the chromosomes one finds a mechanism by which offspring may inherit from both parents if it is assumed that the factors for the hereditary characters are resident in the chromosomes.

It is possible to distinguish male from female by differences in the chromosome content. While all other pairs of chromosomes consist of two chromosomes exactly alike in size and shape, one pair differs in two sexes. For this reason these chromosomes are referred to as the sex-chromosomes. In many cases there is a pair of sex-chromosomes in one sex and a single chromosome representing this pair in the other. For example, in the female of a particular species there may be 17 pairs of autosomes and 1 pair of sex-chromosomes, whilst the male has 17 pairs of autosomes and a single sex chromosome. In other cases the total number is similar in the two sexes, but whereas in the female the sex-chromosome pair consists of members of similar size and shape, in the male the two are unequal. For purposes of description these two types of difference in the sex-chromosome content are referred to as follows: the sex-chromosomes that in size and shape are similar are known as the X-chromosomes. The female in the illustration used above would then possess a chromosome content of 34 autosomes + XX, the male 34 autosomes + XO, or if the chromosome total is the same in the two sexes, the female would be 34 + XX and the male 34 + XY. Y signifies the unequal mate of the X in the male. A bull possesses the XO type of sex-chromosome constitution. The ripe eggs of a female possessing 36 chromosomes, of which 2 are sex-chromosomes, would contain 18, and of these one will be an X; but in the case of the XO male, half the sperm would contain 18 chromosomes, one of which is an X, whereas the other half will contain 17 autosomes and no X. An X-bearing egg can be fertilised by an X-bearing sperm to form an XX individual—a female in this case. An X-bearing egg can equally well be fertilised by a sperm that carries no X-chromosome to give an XO individual—a male. The same scheme holds true for the case of the XY type of male. This

XY:XX (or XO:XX) sex-chromosome mechanism ensures the automatic production of males and females in equal numbers in each generation, and through it sex is determined at the moment of fertilisation. One sex, in the case of the domesticated mammals the female, is homogametic, elaborating but one kind of gamete, as far as the components of the sex-chromosome sex-determining mechanism is concerned; whilst the other sex is heterogametic, elaborating two kinds of gametes, those leading to the production of males and those leading to the production of females.

In the case of cattle, the bull elaborates two sorts of sperm, and if he produces these in equal numbers, if each sort is equally functional, and if fertilisation is random, then the primary sex-ratio—*i.e.*, the numerical proportion of male and female zygotes at the time of conception—should be equality. If, on the other hand, there is a differential production of the two sorts, or if one is relatively less active than the other, or if there is a selective mortality among the zygotes, then the secondary sex-ratio at the time of birth will be more or less profoundly disturbed.

In the case of the bull, it has been possible by measuring the length of the heads of a great number of spermatozoa to show that there are two size classes—a large sperm, presumably the X-chromosome-bearing; and a smaller sperm, presumably the sperm without the X.

The physiology of sex-differentiation.

It is assumed that there are male-determining and female-determining factors, that these are present in every zygote, and that they are borne on the chromosomes, both sex-chromosomes and autosomes, and that these factors elaborate sex-differentiating substances, enzyme-like in nature, and that in the male (XO or XY in constitution) the male sex-differentiating substances are effectively in excess over the female sex-differentiating substances during that period of development when the sexual organisation becomes differentiated.

The zygote is either a "determined" male (XO or XY) or a determined female (XX), but much must happen before the zygote can become a functional male or, on the other hand, a functional female. The complicated processes of sex-differentiation, during which the sexual organisation of the individual assumes one or the other type, male or female, must be pursued before one sex can be distinguished from the other by differences in anatomical structure and physiological functioning. This period of sexual differentiation occurs quite early during the development of the foetus, and begins after a preliminary phase of growth and of general

organ-formation. At the beginning of this period of sex differentiation the reproductive system consists of paired indifferent gonads (neither ovarian nor testicular in structure); a rudimentary accessory sexual apparatus of two ducts, the Wolffian and Müllerian; and external genital organs, which have the form of a cleft, the urogenital sinus, and a rudimentary erectile organ, the phallus. As differentiation proceeds it is seen that either the gonads become testes, the Müllerian ducts atrophy and the Wolffian ducts continue their development to become the functional deferent ducts of the male, and the phallus and urogenital sinus become the penis and scrotum, or else the gonads become ovaries, the Wolffian ducts atrophy, whilst the Müllerian ducts fuse to become the uterus and vagina, and the phallus and urogenital cleft develop into a clitoris and vulva. One or other type of sex-organisation is developed from embryonic structures commonly possessed by all individuals, determined male and determined female alike. Sex-differentiation is alternative. The effects of castration, of implantation of ovary and testis in gonadectomised individuals (individuals from which the gonads have been removed by operation), of the recent rejuvenation work, show quite clearly that in the case of the domesticated mammals such as cattle, the gonads play an important rôle in this process of sexual differentiation. It is definitely established that for the appropriate differentiation of the male type of differentiation of the accessory sexual apparatus, external genital organs and those characters of body form that distinguish male from female, the presence of a functional testis is essential during development, and that for the appropriate differentiation of a female type of sex organisation a functional ovary must be present.

It is assumed that the indifferent gonad develops into a testis in a determined male because the male differentiating substances direct its differentiation, whereas in an internal environment (the embryo itself) of "femaleness" the gonad becomes an ovary. When the gonad has thus differentiated it is seen on microscopical examination of stained preparations that it consists essentially of two sorts of tissue—that which is concerned with the elaboration of the gametes, and another kind, the so-called interstitial tissue, which is held to be the source of a specific sex-hormone, a chemical substance which, circulating in the blood, is concerned with the differentiation of the remaining parts of the sexual organisation. There is thus a male sex-hormone and a female sex-hormone, and these are specifically different.

The part played by the sex-hormones in the differentiation of the sex-organisation is well illustrated by the case of the bovine free-martin, which is now known to be a "determined" female, co-twin to a normal male, the reproductive system

of which becomes abnormal during intra-uterine life. A male (XO) and a female (XX) zygotes are concerned. The two fertilised ova pass into the bicornuate uterus, and become attached to its walls. As they increase in size the embryonic membranes of the two fetuses meet, adhere, and usually fuse. If fusion occurs, developing blood-vessels pass from membrane to membrane, and a common blood communication becomes established. Thus the situation arises in which the sex-hormone of the male can pass into the body of the developing female, and that of the female into the body of the developing male. The sexual differentiation of both individuals will be pursued under the direction of that sex-hormone which is exhibited earlier or is the more potent. The testis of the male becomes differentiated at an earlier stage than the ovary, and so the sex-hormone of the male is liberated into the blood-stream before that of the female. The result is that the differentiation of the sexual organisation of both male and female is pursued under the direction of the sex-hormone of the male. The female thus comes to possess more or less completely the male organisation. It would not be expected that she should become completely possessed of the male type of sexual organisation, because her tissues are all female in chromosome-constitution. Her internal reproductive organs are more or less completely male in type, her external genital organs more or less completely female. The external genital organs of the free-martin may be obviously abnormal, or they may appear to be normally female, but she may never come on heat owing to the gross abnormality of her internal reproductive organs. But every heifer calf born co-twin to a bull is not a free-martin—it is estimated that about one in eight is normal. It is only when fusion of the embryonic membranes occurs and a vascular inter-communication is established that abnormality of the female follows.

It would appear, then, that in cattle the male is heterogametic, possessing a constitution represented by the formula XO; that sex is determined at the moment of fertilisation; that in the XO type of individual the embryonic gonad becomes a testis; that in the XX type it becomes an ovary; that ovary and testis elaborate specific sex-hormones; and that under the direction of these the differentiation of the sex-organisation is pursued.

The bearing of these facts upon certain beliefs.—Many and varied are the theories that have been and are being advanced by breeders to explain the phenomenon of sex-determination in cattle. They are all alike in one respect: they assume that it is the cow that is heterogametic, that she it is that elaborates some ova that are destined, when fertilised, to become females and others that inevitably become males.

There is no scientific support for such a contention. A cow with but one ovary can still beget both male and female calves. The problem of the control of the sex-ratio is that of the differential production of the two sorts of sperm by the bull. When measures have been devised to secure such a differential production, it will then be possible to obtain a calf of the desired sex. It is known that in the case of certain sires there is such a differential production; it is known that the sex-ratio varies with the season of the year and with the general physiological condition of the parents. To a slight extent it is already possible to control the sex-ratio. In the case of cattle the most profitable line of research in this field would appear to be the development of methods of separating the two sorts of sperm, and of performing artificial insemination with one or the other sort.

In the case of the theories mentioned above that are unsubstantiated by any evidence acceptable to science, it must be remembered that a normal calf must be either a male or female, and that the chances that a calf will be a male rather than a female are as 118:100—practically an even chance, and that it is perfectly easy to explain away a case that will not fall into line. Most of the cases that seem to support the contention that the cow is the heterogametic sex are to be explained on the assumption that certain sires habitually (or seasonably?) produce more X-bearing than no-X-bearing sperm, or that in certain cases the conditions within the reproductive passages of the cow are such as to favour fertilisation by one rather than by the other sort of sperm.

The examples of the problems and methods of the geneticist that have been outlined may perhaps help to persuade the breeder that in the science of genetics there may lie much of importance to the livestock industry. Example could be multiplied by example, for the greatest activity prevails in this particular field of biological inquiry. It is not too much to say that many of the problems which face the breeder can only be solved by the application of genetical methods, and depend for their solution on the full co-operation of the geneticist and the breeder.

It is desirable that the breeder with vision should consider possible changes in the standardisation of his stock that may be forced upon him by changes in the demands of the public, and that he should then inquire of the geneticist how best these modifications may be effected. One of the most interesting observations concerning animal breeding would seem to be that it has been impossible so far to combine in one same stock certain characters exhibited to a remarkable degree by two dissimilar stocks. For example, it has not

been possible to develop a dual-purpose breed of cattle exhibiting those characters that make the beef breed and those that make the milk breed and exhibiting those characters to the same degree of excellence as do the beef and milk breeds respectively, or to make a dual-purpose sheep exhibiting those characters that make the wool breeds and those that make the mutton breeds to the same degree of excellence as do the mutton and the wool breeds respectively. To do so may be impossible for physiological reasons, but this has not been demonstrated conclusively. It is not improbable that within the next fifty years the home farms of Britain will urgently require a new type of dual-purpose animal, and it may be the pressing business of the stockbreeder to anticipate this demand. Of course, this is not a problem in genetics: it is entirely a matter for the breeder, but if it should be the case, then experiment should be launched at once. It is not impossible that the demands of the consumer will increasingly call for baby-beef or yearling cattle. In the face of so urgent a demand the breeder in many cases will be forced inevitably to modify his present standards. It would be suicidal for breeders to persist in developing late-maturing cattle when the market calls for early-maturing. Another matter that can only be solved through the co-operation of breeder and scientist is that of the inheritance of immunity to disease. It is established beyond all doubt that many types of disease can be combated by breeding for immunity—immunity to a specific disease being in many cases a definite hereditary character. It is not inconceivable that the defence against foot-and-mouth may not have to be tackled partly along these lines.

Livestock breeding is probably the most dynamic of the crafts. It behoves the British breeder to make himself aware of any advances in knowledge that can reinforce his craft. The geneticist is quite confident that if the breeder would only make himself aware of what has been done in the character-analysis and character-synthesis of the ordinary laboratory material, and could persuade himself that what applies to the case of these holds true also in the case of domesticated stock, there would be no more need for the geneticist to plead for an opportunity of making his contribution to the further development of the livestock industry in this country.

INSECT PESTS OF 1924.

By R. STEWART MACDOUGALL, M.A., D.Sc., Consulting Entomologist to the Society.

OX WARBLE FLIES (*Hypoderma*).

IN the 'Transactions' of last year I gave some notes on dressings that we had tried in the spring of 1923 with a view to obtaining a preparation that could be relied on to kill the larvæ of the Ox Warble Flies in the backs of cattle. Similar experiments were conducted in the spring of 1924, but on a smaller scale. All the animals treated were in East Lothian at the time of treatment and examination, but only a proportion of these had been grazed in East Lothian—that is, the rest had come into East Lothian already affected with *Hypoderma* larvæ. The following table will show this:—

Location in spring and summer (i.e. during the period of infection) in 1923	Number of cattle examined	Number of cattle warbled.	Number of larvæ
Ireland . . .	135	76	482
East Lothian . .	271	54	152
North of England .	12	2	17
Lanark . . .	2	1	4
Carlisle . . .	5	2	3
Dumfries . . .	6	1	8
Annan . . .	1	1	5

The dressings experimented with in spring 1924 were nicotine sulphate in combination with lime, and nicotine sulphate in combination with sodium carbonate. Experiments will be continued in 1925, and the completed results will then be recorded. At present all that need be said is that the nicotine sulphate and lime dressing proved most encouraging. A high percentage of "kills" resulted, and the treatment had no ill effects on the cattle dressed.

Compared with our 1923 observations, the presence of Warble Fly damage was much less marked in 1924, and the observations in the open agreed with examination of the hides passing through the abattoir in Edinburgh. The lessened

infestation was due, in part at least, to the unfavourable weather conditions in summer 1923—unfavourable, that is, to the Warble Flies and their egg-laying. The equally or more unfavourable conditions in summer 1924 should result in a still further falling off in the number of Warbles for 1925.

It may be interesting to such of our members who recall the life-history of the Warble Flies, and the fact that in one



Fig. 17.—*Early stage larva of Hypoderma lineatum in gullet of os.*

Natural size From nature.

of its stages the larva dwells in the gullet, to hear that we have been able to examine the gullets of slaughtered animals for *Hypoderma* larvæ. The dissection has been done in my laboratory by Mr J. W. McHardy, B.Sc. Young larvæ have been found in the gullet, in numbers varying from one to nearly forty in single gullets. An inflammatory infiltration is the outward and visible sign in the gullet of the neighbourhood of a young Warble Fly larva. Fig. 17 is a photograph

of a small piece of the gullet of an ox, in which, by dissection, the larvæ have been exposed.

WARBLE FLY OF THE REINDEER (*Edemagena tarandi*).

Larvæ of this fly were brought to me, taken from the back of reindeer in the Zoological Garden, Edinburgh. These larvæ cause emaciation. I have specimens also from London, and Professor Carpenter has taken larvæ from reindeer in the Dublin Zoological Garden. The larvæ, which were in their last stage, looked not unlike those of the Ox Warble Fly, but both surfaces of the reindeer larvæ are equally spinous. The Warble Fly of the reindeer is a native of Lapland and North America.

IMPORTED INSECTS AND THE EASE OF THEIR SPREAD IN COMMERCE.

THE COLORADO BEETLE (*Leptinotarsa decemlineata* Say).

This beetle and its grub can be very destructive enemies of the potato plant. Last year I mentioned the fact that, owing to the Colorado Beetle being present and at work over a certain area in France, to which it had been accidentally introduced, the Ministry of Agriculture and the Board of Agriculture had in an Order prohibited the introduction of potatoes from that area as long as the pest existed. In 1922 the beetle was discovered at work in the neighbourhood of Bordeaux and the country surrounding, and, in spite of prompt destructive measures and special legislation in France, the pest has not yet been overcome. £20,000 had been voted by the French Government for the campaign against the insect, and in the "Journal Officiel" it was decreed that no potatoes or leaves or packing for the plants must be imported from the United States, nor any fruit or vegetable on which the beetle might be found on its entry into France.

The Colorado Beetle has a wide distribution in the United States. Annihilation in America is now impossible, and destructive and curative treatment there, have now become part of the regular season's work in the culture of the potato crop. The widespread occurrence of the Colorado Beetle in the United States, associated with the fact that markets were being sought in Britain for the export of surplus potatoes, increased the likelihood of the carriage of the beetle from the United States to Britain, and the Ministry and the Board have placed a ban on the importation of potatoes from the United States.

The Colorado Beetle has a very interesting history. It is

possible that in past days it migrated from the north of South America, and there is some evidence of its having given rise to various forms or strains, one of which came to be known in Colorado, where both beetle and grub fed on a wild Solanaceous plant, *Solanum rostratum*. In 1860 to 1870 the beetle began to be noticed in the United States as harmful. As settlers in the States moved westwards their potato patches linked up with the wild Solanum, and the beetles, leaving the weed plant and settling on the cultivated potato, began to travel eastwards. By 1865 the pest had crossed the Mississippi, and by 1874 it had reached the Atlantic, and moving farther south, and also north over the border into Canada. The spread took place along the railway lines and the river courses, partly by carriage in train and ship, and partly by favouring winds in summer during the flight period of the beetles. In favouring seasons, in the East United States, plague-swarms now and again occurred, and there are records of swarms that had flown out to sea being drowned and then swept up by the sea in great banks on the shore.¹ Northward and southward migration of the insects, in America, has been restricted by temperature. A temperature of 38° C. limits their southern migration, this being fatal to eggs and grubs. On the other hand, the lower temperature of Canada as compared with the central United States limits northern spread. But the insect has to be watched. Thus, first known in British Columbia in 1918 just at the border, by 1922 it had penetrated thirty miles farther in. Several times before its 1922 invasion of France the Colorado Beetle had been found in Europe—in Germany in 1876 and 1877, also in Holland in 1877—carried in ships from America. In 1887 when it was again taken in Germany, 30,000 marks were expended in annihilative measures. In 1901, about the middle of August, in some allotments at Tilbury Docks, the Colorado was found. Very drastic measures were at once practised; but some of the early larvæ had gone deep into the soil for hibernation beforehand, and a few adults from these appeared in the next late spring or early summer: they were destroyed.

The persistence of the Colorado Beetle in the Gironde area of France since 1922 is certainly disquieting, and a justification for protective measures and for keen observation. The climatic conditions of some parts of England are suitable enough for the insect, and the Colorado Beetle has already shown itself so adaptable to environment that no risk should be run in our country, although I believe that the more changeable and severer weather of Scotland greatly disfavour this insect.

The adult beetle (see Fig. 18) is very easy to recognise. It

¹ Soraner. Handbuch der Pflanzenkrankheiten, vol. iii. p. 516.

measures about half an inch in length and about a third of an inch in breadth. The upper surface of the body is strongly convex. The colour of the beetle is yellow; each wing-cover has five longitudinal black lines; the prothorax (the region behind the head) has two elongated black blotches near its middle, and smaller black spots towards each side.

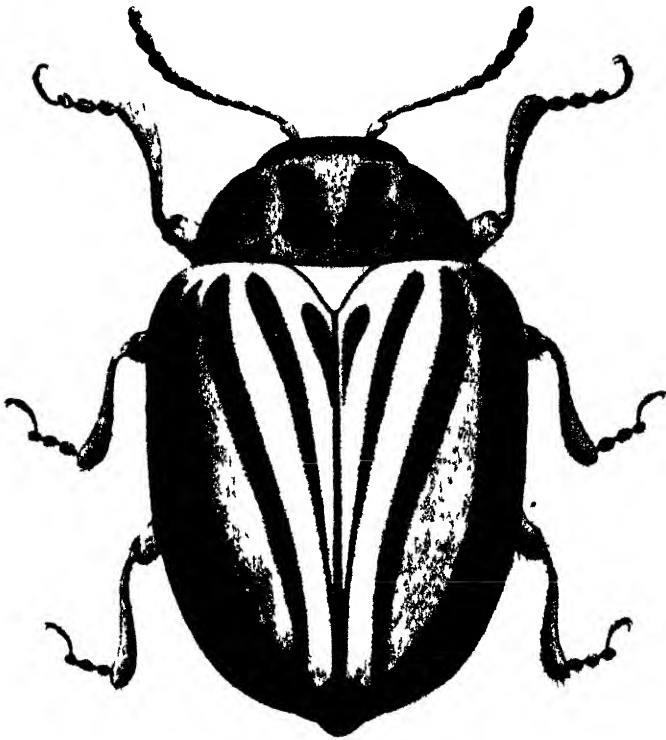


Fig 18. —*The Colorado Beetle (Leptinotarsa decemlineata)*.

Enlarged drawing by J. F. DUNCAN, from one of my specimens

The larva or grub (Fig. 19) has a small black head provided with biting jaws; the legs are six in number and black in colour; the colour of the body varies somewhat according to the stage of the larva, from dull red in the young stage, to paler brick red or orange red in the later stage; a double row of black or dark spots runs down each side of the body; the body is soft; and the hind or abdominal part is larger than the rest of the body and is rounded above. The full-grown grub measures just over half an inch.

The winter is passed, in the adult stage, in the soil. In the following spring the beetles appear from their winter quarters, and proceed to their egg-laying. A very large number of eggs can be laid by a single female during her several weeks' life. The eggs are laid in clusters on the under sides of the leaves. The full-fed grub leaves the plant and enters the soil for pupation; the pupæ lie protected in a cell of earth several inches below the surface. According to the environment, there can be two or, it may be, three generations in a year.



Fig 19.—*Larva of Colorado Beetle* (*Doryphora decemlineata*)

Enlarged drawing by J. F. DUNCAN, from one of my specimens.

Both adults and larvæ are voracious and destructive feeders, shoots as well as leaves being eaten.

While normally a feeder on *Solanum* and plants of the same Natural Order, such as thorn-apple, henbane, belladonna, tobacco, tomato, the insect has also been found on poppies, hedge mustard, goosefoot, several thistles, and red currant.

The likely stage for the Colorado Beetle to be introduced is the adult winged stage. The beetles fly well, and they may fly on board ship in port, and, after sheltering in packages or

collections of plants, or in plant-packing or debris, they may on reaching a new port fly ashore. Should even one beetle chance to be a female already fertilised, she may be able to give rise to a new brood if suitable food plants be found.

It may be asked, if the Colorado Beetle is so destructive and so common in the United States, how is it no longer the feared enemy there. The answer is that the disease has brought the cure, or rather the annihilative and remedial measures. Arsenical dressings, now so universal in their use, owe their appearance in economic entomology, to a great extent, to the early efforts made to control the Colorado Beetle in the period of the scare in the United States caused by its destructive work. But it is far better to keep the enemy out by such means as the agricultural authorities are taking, or if it gain an entrance, to discover it and to take specially drastic annihilative measures, rather than allow the pest to settle down and have later to be fought every year by more or less expensive control methods, which, even if successful, would mean an annual expenditure that would fall to be placed against income.

Introduced Enemies.—The ease with which insects from other countries can come into Britain receives excellent illustration if I take as examples specimens examined by me in the past few months. At different times three examples of Citrus fruits—viz., orange, lemon, and grape-fruit—have been brought to me, and five different Scale insects were found on these, four in abundance.

On oranges and lemons from Spain, the Purple Scale was found. On oranges from Spain, and on lemons from Palermo, the Red Scale was found. In warmer countries the Red Scale is a very severe enemy of the orange, infesting, as it does, branch and leaf and fruit. On the oranges examined, males, females, and newly hatched young Scale Insects were present. On orange two other Scale insects—viz., *Mytilaspis gloverii* and *Parlatoria pergandi*—were present, and on still another orange, *Aspidiotus camelliae*. On grape-fruit from Porto Rico *Mytilaspis gloverii* was present.

As the fruits named are carried all over the world, these five Scale insects have now a world distribution, and are more or less troublesome enemies where the climate favours their life in the open. One of the five, *A. camelliae*, lives in England under glass, and also in the open on various host plants. The insects named above as found on Citrus fruits, although they come to us abundantly on the various fruits, are neglected by us because they do not find the environment necessary for their development and growth; and even if they did, appearing in our country on the fruits, they perish with the fruits. Great numbers of them, too, are found, on examination, to be dead, from a growth of mould during transit.

THE APPLE MUSSEL SCALE (*Lepidosaphes ulmi*).

I have described this insect more than once in past 'Transactions.' It is not uncommon, and yet often escapes notice not only because the scale is small, but also because the colour of the outside secretion harmonises so well with the colour of the bark. Fig. 20 shows an infested branch of apple, natural size, and Fig. 21 shows an infested piece of branch about four times magnified. In Fig. 21 the branch will be seen to be crowded with small mussel-shaped structures. The mussel-shaped structure is not the insect itself, but a shield or cover of waxy or fibrous material spun for the protection of the insect by numerous sets of spinning glands; incorporated with the protecting shield, there can be seen at the front end, under the microscope, two moulted skins, one behind the other, of the previous two earlier stages of the insect.

When one turns over one of the shields, at any time from September till the next spring one can see, by aid of a good hand-lens—better by the low power of a compound microscope,—the more or less shrivelled body of the female at the narrow end, close to and behind the two moulted skins, and behind her a cluster of small eggs up to eighty in number. These eggs remain unhatched over the winter. In June tiny six-legged larvæ hatch out, and, escaping by the hind end of the shield, they scatter over the branches. In a short time the larvæ settle down, pierce the bark with their long thread-like mouth-bristles, and proceed to pump away the sap. A shield is secreted for protection, and a moult takes place; the insect in its new second stage is legless, and never moves from the place of moult unless destined to become a male. Later a second moult takes place, resulting, after feeding and growth, in the case of the female sex, in an adult female which still feeds on the sap of the tree, and becomes sexually mature and ready to pair. The development of the male is somewhat different, for after a resting pupal stage a delicate two-winged insect emerges. The shields under which males are developed can be distinguished from the shields spun by the females by their being smaller and not so distinctly mussel-shaped. The males, when ready, emerge from the hind end of their shield. The male does not feed; his function is to find the female and provide for the future of the race. The male has distinct eyes, a pair of long exploring sensory feelers, two wings, and at the hind end a projecting copulatory apparatus. After pairing the males die; the fertilised females proceed to egg-laying, and then die, in early autumn. In some Scale insects no males have been discovered yet. The Apple Mussel Scale insect has males, but the females far outnumber the

males. In this species we meet with an interesting example of the hatching of eggs that have not been fertilised. The eggs of virgin females hatch, giving rise to young which develop



Fig. 20. — *Branch of apple tree covered with Apple Mussel Scale.*

From nature Natural size



Fig. 21 — *Branch of apple tree covered with Apple Mussel Scale*

From nature About 4 times magnified

normally. The damage to a branch or plant infested by the Mussel Scale is due to the loss of sap drained away by the sucking or pumping action of the mouth apparatus.

Treatment.—When a tree is badly attacked, it should be

treated with a winter wash—*e.g.*, the Woburn Winter Wash, whose formula is :—

Iron sulphate . . .	$\frac{1}{2}$ lb.
Lime . . .	$\frac{1}{4}$ lb.
Caustic soda . . .	2 lb.
Paraffin . . .	5 pints.
Water . . .	10 gallons.

How to Make.—Dissolve the iron sulphate in about nine gallons of water. Slake the lime in a little water, stirring well, and add more water till a "milk" is formed. Run this milk of lime into the solution of iron sulphate through a piece of sacking or a fine sieve in order to remove grit. Now add the paraffin, and *churn thoroughly* (this is very important). Just before using add the caustic soda in a powdered form. This wash, being a caustic one, burns, therefore the hands and face of the sprayer need protection. The hands should be covered with rubber gloves; a thorough greasing gives protection. Such a winter wash should only be used when the trees are in a dormant condition, and always before the buds have burst, not later, say, than the beginning of February. One must not use a caustic wash on the same tree every year because of the risk to the health of the tree.

In using the wash care should be taken to see that the Scales are reached and wetted, so as to ensure their destruction; only great care will ensure that crevices and shelter places are reached by the wash. If the sprayed tree or trees be in a grass orchard, then live stock should be kept out for a fortnight.

A leaflet of the Ministry of Agriculture recommends an oil emulsion for washing badly attacked trees any time from November till February, and gives the following as a formula for a home-made emulsion :—

Paraffin oil . . .	1 gallon.
Soft soap . . .	$1\frac{1}{2}$ to 2 lb.
Water . . .	10 gallons.

How to Make.—First dissolve the soap in about a gallon of boiling water. The soap solution is then removed from the fire and the paraffin at once added, the whole being thoroughly mixed by the means of a hand syringe. This is the stock which, when required for use, has nine gallons of water added to it, the whole being thoroughly churned before use.

A modification of the above, so as to allow application at the time of hatching of the eggs in case there has been no winter treatment, is :—

Paraffin . . .	2 pints.
Soft soap . . .	1 lb.
Water . . .	10 gallons.

This should be applied in the beginning of June.

THE BLACK ASH BARK BEETLE (*Hylesinus crenatus*).
(Fig. 22.)

This Scolytid beetle is found on older ash trees with thick bark. The beetles choose for their brood galleries unhealthy and dying trees. The species is the largest of the Ash Bark

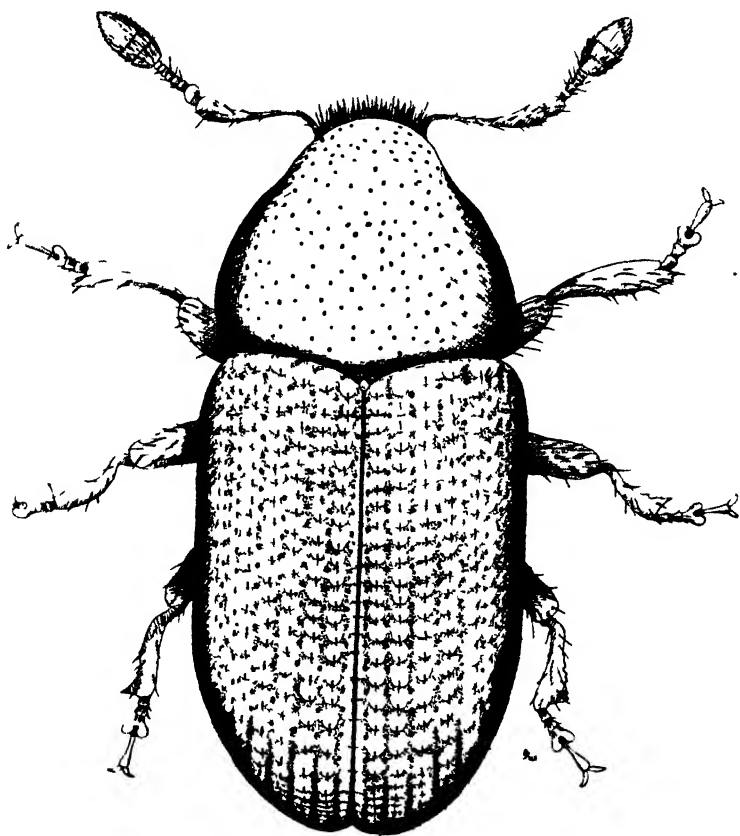


Fig. 22 — *Hylesinus crenatus*.

Enlarged drawing from nature by J. F. DUNCAN from one of my specimens

Beetles, and is not difficult to recognise if one possesses a hand-lens. In size the beetle measures only about one-fifth of an inch; it has an oval arched appearance; in colour it is black, and the beetle is not markedly hairy; the thorax is narrowed in front, and when examined by aid of a lens is seen to be coarsely punctured on the upper surface; the

wing-covers are rough, with prominent longitudinal lines and interspaces. The nature of the antennæ marks the beetle

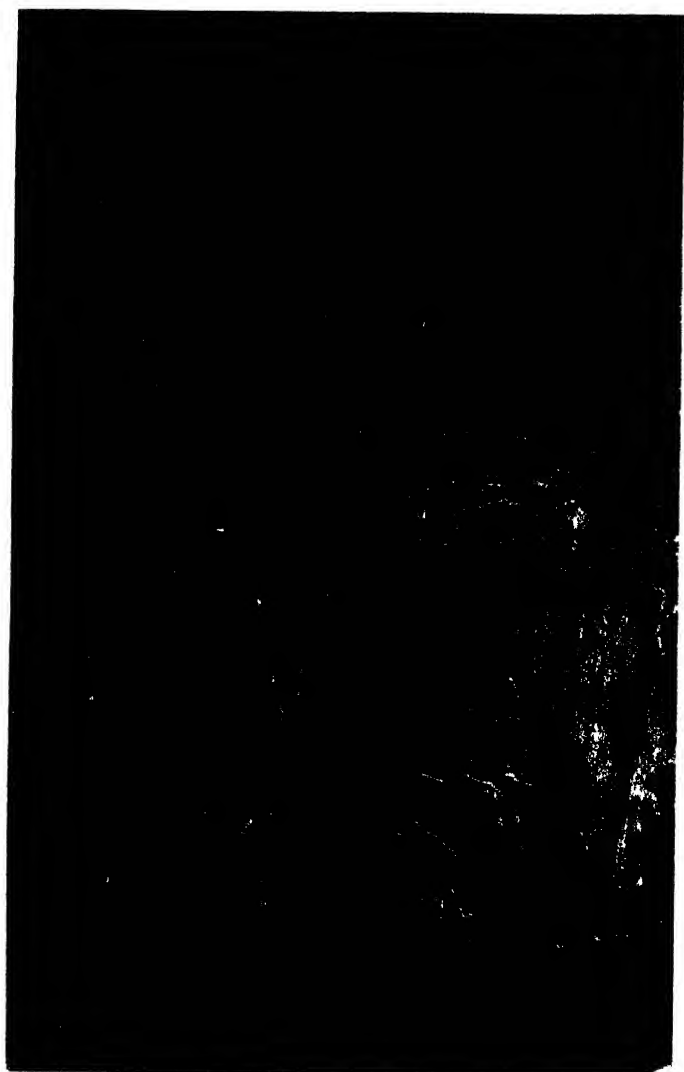


Fig. 23.—*Mother and larval galleries of Hylesinus crenatus.*
From nature. Reduced.

out as a *Hylesinus*, but a microscope is necessary for the details. Under the microscope the antennæ are seen to consist of a shaft, a whip, and a club. The shaft is the single

joint next to the head ; the whip has seven joints ; and the club is somewhat compressed, elongated, and jointed. (See Fig. 22.)

The female enters the bark, and after pairing eats out a 2-armed gallery (Fig. 23), the arms running in the transverse direction, and one of them being shorter than the other (sometimes there is only one arm) ; if there be overcrowding because of the onset of a large number of crenatus, then the pattern becomes somewhat irregular. Along the sides of the 2-armed gallery eggs are laid ; the grubs on hatching gnaw out galleries of their own between the bark and the wood, the outermost sap wood as well as the bark showing the galleries. These galleries run vertically upwards or downwards. At a little distance from the mother gallery the larval tunnels may change direction, and become more or less transverse or irregular ; but here again a great deal depends on whether the brood has elbow-room to work. At the end of their tunnels the grubs, on being full fed, pupate in a hollowed-out bed, this pupal bed lying to a great extent in the bark. The adults, when ready, issue each by its own exit-hole, bored from the pupal bed to the outside. *Hylesinus crenatus* is sometimes confused with another Ash Bark Beetle, not so common in Scotland but abounding in England—viz., the Variegated or Speckled or Spotted Ash Bark Beetle (*Hylesinus fraxini*).

The two species can be distinguished as follows :—

<i>Hylesinus crenatus.</i>	<i>Hylesinus fraxini.</i>
Larger.	From half the size to over half the size.
Black.	Pale brown to dark brown.
Not speckled.	Grey scales here and there over the upper surface give the beetle a speckled or patchy appearance.
Mother gallery 2-armed in the transverse direction, one arm longer and one shorter.	Mother gallery 2-armed in the transverse direction, both arms practically equal in length.
Larval galleries long, and more or less winding.	Larval galleries short.
Brood galleries larger in diameter.	Brood galleries less in diameter.
Brood galleries on trunk.	Brood galleries on branches and crown, but in trees in the pole stage and also older can be on the main trunk.

THE PINE SHOOT BEETLE (*Myelophilus piniperda*).

This troublesome enemy of pine, more rarely of spruce and larch, continues to be sent, or examples of its work, for identification. The genus *Myelophilus* is recognisable by the antennae. Fig. 24 is a drawing by Dr J. W. Munro of one of the antennae, the microscope being necessary for the details. There is a basal shaft (the elongated single joint), followed by a whip of six joints, and a rounded club, which is somewhat pointed in front.

The adult beetle measures about one-sixth of an inch in length, and when mature is black or black-brown; the prothorax narrows to the front end, and under a high magnifica-



Fig. 24 — Antenna of
Myelophilus piniperda
Greatly enlarged from nature

tion shows punctures; the wing-covers show longitudinal punctured lines and interspaces with tubercles. Very careful examination reveals the absence of tubercles near and at the tip of the wing-covers on the second interspace on each side of the suture. At these places the interspaces seem somewhat hollowed out. The wing-covers bend round and down at the hind end. A good lens shows the beetle to be pubescent. The beetles for brood purposes enter the bark of the trunk. The female makes a vertical gallery which, with its channel of entry, reminds one of a golf-club (Fig. 25 (a)). Along the sides of this mother gallery eggs are laid, and the larvæ on hatching gnaw out tunnels, which run in the horizontal direction. Pupation takes

place at the end of the larval tunnels, and the adults issue when ready each by its own flight-hole. The length of a generation from egg to adult varies with the temperature and the nature of the material on which the larvæ are working, but from ninety to one hundred days may be taken as a summer average. The length of time taken for such a cycle is not unimportant, in view of the fact that one great method of fighting the pest is by means of trap trees or logs, which have to be barked before the exit of the new generation.

Beetles that issue after pupation are not able to proceed at once to an efficient copulation, but must first feed in order to ripen their reproductive organs. For this feeding the beetles pass to the young shoots in the crown, and into these they tunnel, a small ring of resin marking the place of entry

(Fig. 26). The damage done by the beetles is a twofold damage. The tunnelled young shoots are blown down or wither away, with a consequent loss of feeding area and increment, which can be serious, while the brood galleries may, if very numerous, ring the stem, and so interfere with the passage of sap.

Treatment.—Remove or bark trees felled in winter, or any “blow downs,” in good time, and also sickly trees, as such will instinctively be chosen by the beetles for brood purposes. Sickly trees or felled or blown trees may be used as trap trees, which the beetles will enter for egg-laying. A series of such traps should be prepared from spring onwards to autumn. Whether the traps have been used by the beetles for brood purposes can be told by beads of resin exuding from the bored trunks, and by little heaps of extruded sawdust or boremeal. In good time the trap trees or logs must be barked, and the bark with its content of larvae burned.

THE LARGE SPRUCE BARK BEETLE or *Typographus* (*Tomicus* or *Ips typographus*).

Bark Beetles of the genus *Ips* or *Tomicus* have an excavation at the hind end of the abdomen marked in the various species by the varying number and size of “teeth” on each side of the excavation (Fig. 27).

The *Typographus* is rare in Britain, but probably seems rarer than it is on account of its characters not being known. It is a spruce-infesting species, the brood galleries being made typically in old spruce, although when the beetle is in numbers, as sometimes happens on the Continent, younger spruce may also be attacked. Its common name *Typographus* is due to the very plain galleries of large diameter made in the bark.

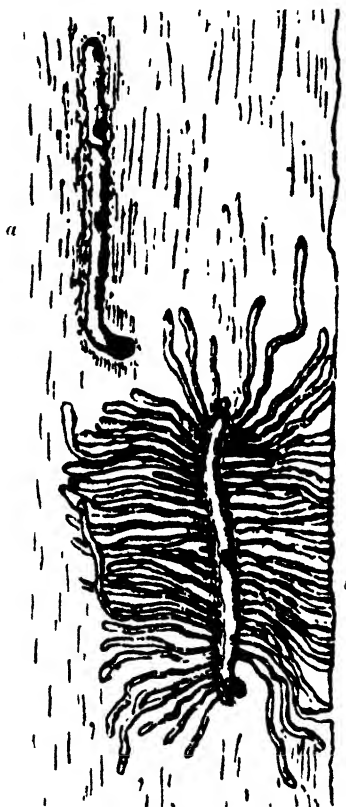


Fig. 25.

a, Mother gallery of *H. piniperda* showing two air holes; b, Mother and larval galleries (After Nitsche)

Ips typographus is one of our largest bark beetles, measuring up to one-fifth of an inch and over. The colour is black or brown, and there are evident greyish-yellow hairs; the funiculus of the antennæ is five-jointed; the prothorax is rough in front and finely punctured behind; the wing-covers have longitudinal deeply-punctured lines; at the hind end is an



Fig. 26 - Entrance hole to young shoot made by adult pine beetle and marked by a ring of resin.

(After Eckstein)

excavation with an oblique gentle slope; each edge of the excavation is provided with four teeth, the third one being the largest (Fig. 27).

This is a polygamous species: the normal happening is for the beetle to have two wives, but sometimes there are three. Fig. 28 is a drawing from one of my specimens, showing the normal condition. The bark has been stripped away from the stem, and the drawing shows on the inside

of the bark a central pairing chamber (this chamber is always gnawed out by the male) from which each female

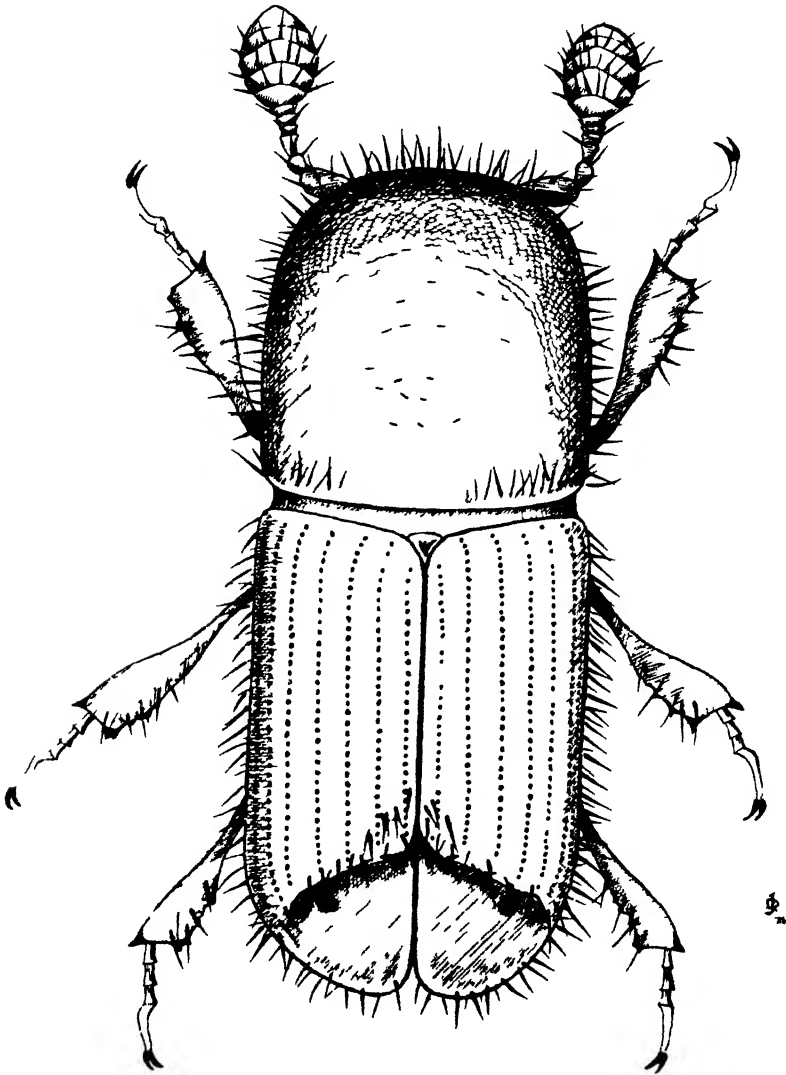


Fig. 27 —*Tonnicus typographus*

Enlarged drawing from nature by J. F. DUNCAN from one of my specimens

has, after pairing, proceeded—one upwards, the other downwards—to gnaw her mother gallery, along which the eggs are laid. Fig. 29 is a drawing from another of my specimens

showing the less usual pattern of brood work where three wives have tunnelled in different directions from the central pairing chamber.

Trypodendron lineatum (Fig. 30).

This beetle is given as an illustration of two species sent to me not unlike one another in appearance. The two beetles are *Trypodendron lineatum*, which bores through the bark

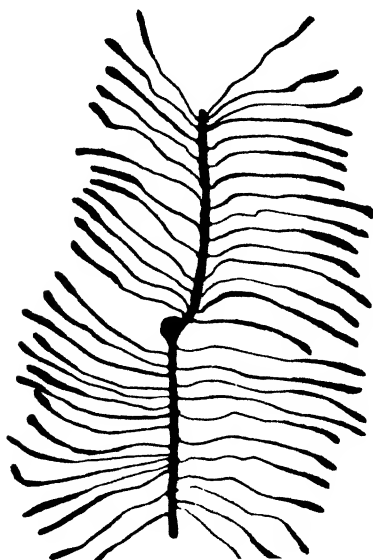


Fig. 28.—Two-armed mother gallery of *Tomiscus typographus*

From nature; greatly reduced

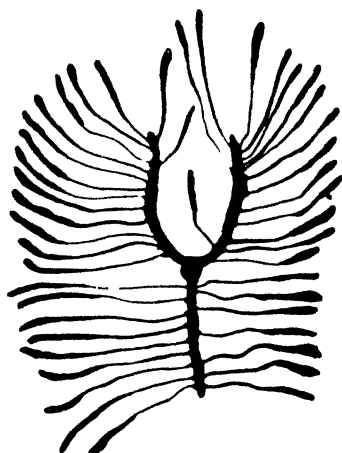


Fig. 29. - Three armed mother galleries of *Tomiscus typographus*, and larval galleries.

From nature, greatly reduced

and right into the sapwood of felled stems and stumps of spruce, Scots pine, and larch; and *Trypodendron domesticum*, which bores into the sapwood of felled broad-leaved species like birch, oak, and beech.

The genus *Trypodendron* is characterised by the rounded body, the dark thorax, and paler wing-covers; the whip of the antenna is four-jointed, and the club is more or less angular or hairy (Fig. 31). The work and the pattern of the brood galleries of *T. lineatum* and *T. domesticum* are illustrated in Figs. 32, 33, 34, 35, 36, which are reduced drawings from my specimens.

The female enters the bark, going straight through into the

outermost wood, tunnelling in the direction of the pith (Fig. 32). Then she turns to make, as a rule, a 2-armed gallery, but sometimes a 1-armed one, following more or less a wood ring, or, it

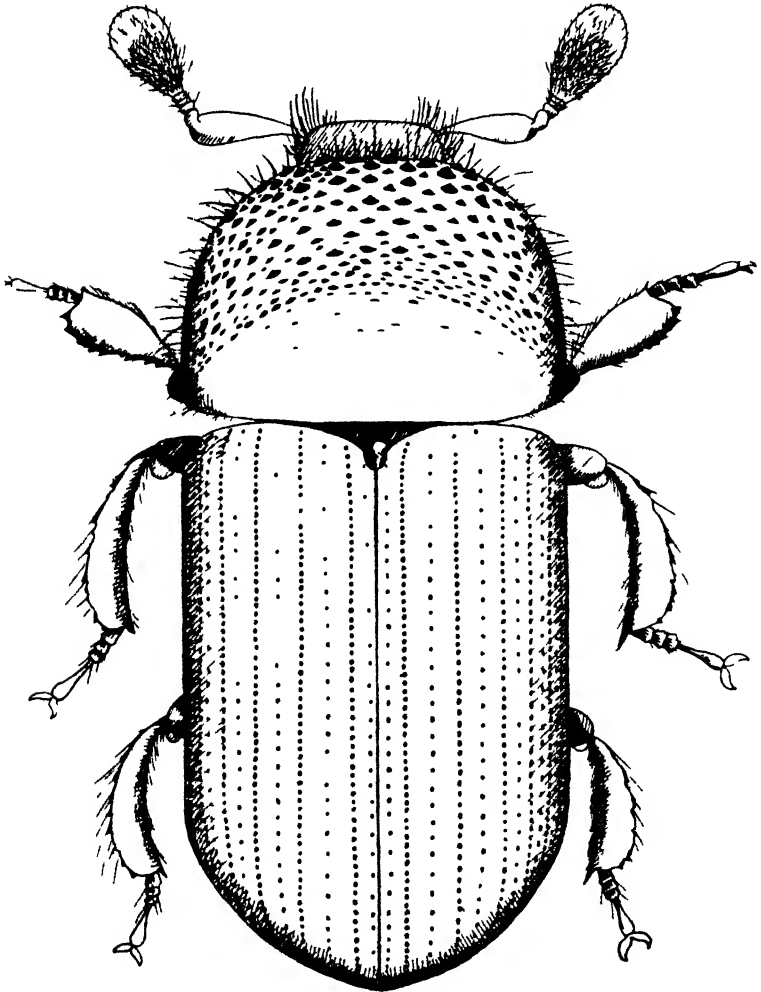


Fig. 30 —*Trypodendron lineatum*.

Enlarged drawing from nature by J. F. DUNCAN from one of my specimens

may be, at different depths of the transverse section. On the upper and lower sides—*i.e.*, above and below—of this mother gallery she lays her eggs as a rule, arranging them not opposite to one another, but alternately. The resulting larval chambers,

which are perpendicular to the mother gallery, are quite short, the brood system in section having more or less the appearance of a single pole ladder with the larval galleries corresponding to the rungs (Fig. 33). The grubs do not nourish themselves



Fig. 31 — *Antenna of Trypodendron domesticum*

Greatly enlarged from nature

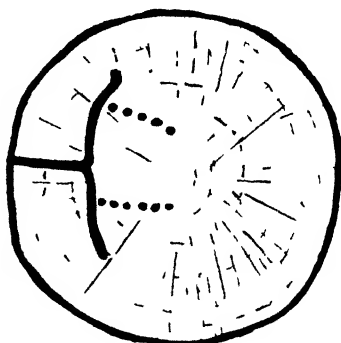


Fig. 32 — *Mother galleries of T. lineatum on transverse section and brood chambers cut across on spruce.*

on bored wood, but feed on a fungus which develops on such sap as is present in the borings: hence the name Ambrosia Beetles given to these species. It has been suggested that the beetles may infect new borings by means of fungus carried

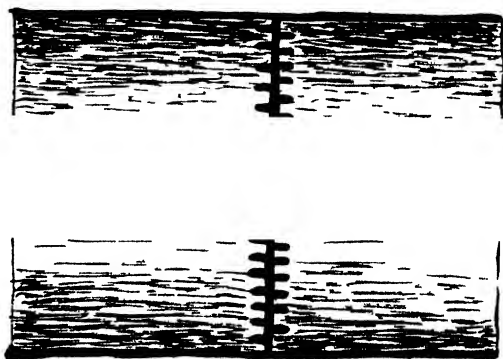


Fig. 33 — *Mother galleries shown, and also, in vertical section, the ladder like larval galleries or chambers on spruce.*

in accidentally, or present unharmed in their excrement. Proof of this, however, though it has been sought for, is wanting. The full-grown larvæ pupate in the small chambers, and the adult beetles emerge, after pupation, not by separate exit-holes

bored for the purpose, as in the so-called bark-infesting forms, but by the old gallery and entrance hole of the mother.

THE TURNIP, MUSTARD, AND CABBAGE FLOWER BEETLE
(*Meligethes ceneus*).

This little beetle and its grubs are found often in great numbers in the flower heads of Cruciferous plants, both culti-

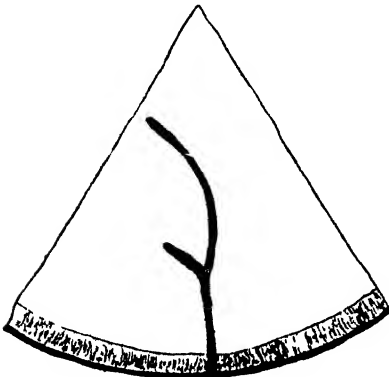


Fig. 34.—Mother tunnel of *T. domesticum* ; on birch.

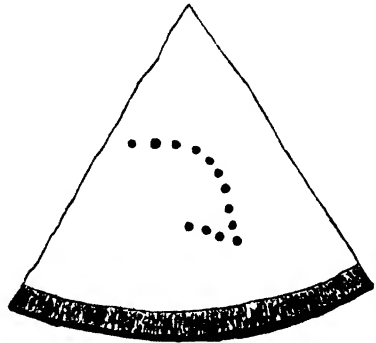


Fig. 35.—Larval chambers of *T. domesticum* cut across ; on birch.

vated and wild. The result of the presence of the insect is that the essential flower parts are destroyed and seed fails. Shrivelled flower heads attest the work of *Meligethes*. Sometimes in the south the beetle is harmful on mustard.

The beetle measures only one-twelfth of an inch in length ; in colour it is brassy or deep green. The greyish-white to

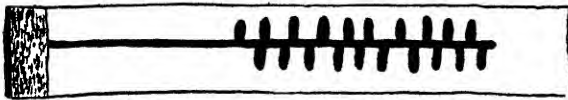


Fig. 36.—Entrance gallery of *T. domesticum*, and mother gallery with the ladder-like larval chambers cut vertically On birch.

yellow larvæ, are typical beetle grubs, jawed and six-legged, and with a muscular process at the hind end.

Eggs are laid in opening buds, and the grubs remain in the blossom until full fed, when they drop away to the ground for pupation.

The most successful method of fighting this enemy is shak-

ing off the insects into a receptacle, which at intervals is treated with boiling water.

In 1915 I recorded this beetle as present in numbers in the month of June in a field in Fife where charlock and runch were common. The beetles in this case were doing useful work.

RECURRENCE OF OLD ENEMIES.

Queries reached me regarding the Magpie Moth, surface caterpillars, the caterpillars of the Tiger Moth, the Gooseberry and Currant Sawfly, big bud on black currant, the Giant Wood Wasp, and lice on horses, all of which I have referred to more than once in past 'Transactions.' The caterpillar of the Grey Dagger Moth came for determination; it was found feeding on apple. The Dagger Moth caterpillars feed on a large number of broad-leaved trees, but never do any appreciable harm. The moths fly in June, and the caterpillars from their eggs are found from July to September. The winter is passed in the pupal condition, the pupa being found on the host tree.

COCKROACHES.

Year after year examples of these insects have been sent to me, generally in an immature wingless stage, and sometimes with a request to name the "beetle" forwarded. Now, in spite of their common name blackbeetles, cockroaches are neither black, nor are they true beetles. A beetle is an insect which has a complete metamorphosis—*i.e.*, the larva or stage from the egg differs in appearance and, it may be, in food habits from the adult, and a resting or pupal or lying-up stage is necessary to complete the changes that will result in an adult differing markedly from its larva. The cockroach, however, has no resting pupal stage in its life-history. From the cockroach eggs come young that, externally, more or less resemble the parent (the young are wingless), and have the same food habits. The little cockroaches feed and grow and moult until at last, after their last moult, we reach the winged adult. Rudiments of the future wings have been showing during development, but the wings in the cockroach are external outgrowths, and the changes between young and adult are such that they can be completed without any lying-up or resting stage. I have once previously made a reference to a cockroach in the 'Transactions,' and I call attention to cockroaches now because during the year references have been numerous as to the cockroach being a possible disseminator of disease, a recent note in newspapers associating the cockroach with the spread of cancer. Certain investigations in Italy have been concerned with this possible association, but there is no proof.

The cockroaches of our houses and bakeries and stores and restaurants are either the Oriental Cockroach, or the American Cockroach, or the German Cockroach (the Germans protest that the so-called German Cockroach is really a Russian). All three are importations to Britain, and I have had them all for determination. In the Plant Houses of the Royal Botanic Garden, where in years that have passed I obtained supplies of cockroaches for a practical class, it was the American Cockroach, winged in both sexes, that was found. Later—and so till now—the species in the houses is the Australian Cockroach, also winged in both sexes. In competition in the houses the Australian Cockroach seems to have overcome the American one.

The female of the cockroach deposits her eggs in a small case secreted by certain glands associated with the reproductive apparatus. Along the two sides of the little case the eggs are arranged in two standing-up rows. These egg-cases can be seen for some time, before the deposition of the eggs is completed, projecting from the hind end of the abdomen of the female. Ultimately the egg-case is deposited in some shelter place, and in due course the eggs hatch, and the young or larval cockroaches escape through a split along the upper edge of the egg-case. It has already been stated that development to the adult condition proceeds through a series of moults. The length of time taken in the development from egg to adult varies with the species—*e.g.*, in the German Cockroach the adult stage seems to be reached in a year, whereas several years may be necessary in the case of the Oriental Cockroach.

Cockroaches are omnivorous in diet. They love warm places for shelter. They are creatures of the dark, hiding in the daytime, their flat bodies enabling them to easily get under cover. They are filthy creatures, tainting food by a secretion from glands and rendering it foul with excrement. Therefore they should be destroyed systematically.

1. Experiments have shown that a temperature of 130° F. is fatal to cockroaches. Such disinfection by heat is worthy of trial if the conditions allow.

2. Pyrethrum Powder—the fresher the better—is effective if it be dusted in the cockroach runs, and the stupefied insects swept together and dropped into boiling water (an instantaneous death) or a little paraffin.

3. Borax has for long had a reputation for keeping cockroaches in check. Tests in the United States indicate that it is serviceable, but the use of it must be thorough and persistent.

4. American tests¹ prove that there is nothing better as

¹ United States Department of Agriculture, Bulletin No. 707.

an insecticide than sodium fluoride. Used undiluted, or mixed with flour, "a mixture of 18 per cent sodium fluoride killed all the cockroaches in the test within twenty-four hours."

5. Mr Frederick Laing¹ has found successful a mixture of sodium fluoride and pyrethrum powder—viz., three parts sodium fluoride to one of pyrethrum. This should be scattered at nightfall in the cockroach haunts, and the dead insects swept up in the morning.

6. Cockroach traps are successful if well baited.

7. On a small scale cockroaches can be trapped in a steep-sided basin baited with a little beer and treacle, and with small pieces of stick affording a pathway up to the top of the basin.

A CASUAL COCKROACH.

On two occasions there were sent to me a foreign cockroach, i.e., not a native of Britain, that had been taken on,



Fig. 37. — *Panchlora viridis*.

Natural size. From nature

and had probably been imported in, a bunch of bananas. Fig. 37 is a photograph of one of the two. The species is probably *Panchlora viridis*.

THE EUROPEAN EARWIG (*Forficula auricularia*).

It has often happened that an animal or a plant, harmless, or at any rate not a pest, at home, has on its introduction to another country proved very harmful. This has happened in the case of the European Earwig, which, introduced into some parts of the United States, has now become a serious

¹ 'The Cockroach: its life history and how to deal with it,' by Frederick Laing, M.A., B.Sc. British Museum Economic Series, No. 12.

garden and house pest. Similarly, introduced into New Zealand, the Earwig has become a pest. A request from New Zealand came to the Imperial Bureau of Entomology asking if parasites of the Earwig could be sent out. The matter was taken up and arrangements made at Rothamsted for the rearing of Earwig parasites. In Britain the Earwig is partly held in check by two Tachinid Flies, whose maggots are parasitic in the Earwig. Earwigs were collected, and, under the supervision of Dr Imms, the two parasites have been reared and several consignments have been despatched to New Zealand, where it is hoped the Tachinids will succeed in establishing themselves.

Tachinid Flies—they look like rather hairy houseflies—act as a check on many of our pests. For example, I have reared Tachinids from the spoiled caterpillars of the Magpie Moth, from the caterpillars of the Pine Sawfly, and from the caterpillars of the Large Larch Sawfly.

In these cases the Tachinid Flies lay their eggs on the larvæ, and the Tachinid maggots feed internally on the host. In the case of one of the Tachinids of the Earwig, the Tachinid Fly lays her eggs near Earwigs, or in cracks or crevices where the Earwigs are lurking. The Tachinid eggs soon hatch, and the newly-hatched maggots bore into the Earwigs and develop at their expense. In the case of the other Tachinid of the Earwig, the female Tachinid lays her eggs on anything on which the Earwigs have been recently feeding. Earwigs swallow these eggs; the eggs hatch inside the Earwig, and the parasite develops, accomplishing in the end the death of the Earwig.

Theobaldia annulata.

This mosquito was sent from Perthshire. Several had been seen about in early March, and they had been inflicting "nasty bites" during the night. *Theobaldia annulata* is a large and handsome mosquito, black and cream coloured, and with the two cross veins of the wing nearly in line. It is one of the only two British mosquitoes with spotted wings, the other being *Anopheles maculipennis*, the carrier of the malarial parasite. The female *Theobaldia annulata*¹ passes the winter as adult, indoors in shelter, and a rise of temperature may induce activity early in the year, and, as in the present case, people in the house may be bitten. The female lays her eggs in water-butts as well as in water in the open.

¹ 'A Handbook of British Mosquitoes,' by William Dickson Lang, M.A., D.Sc. British Museum (Natural History).

GRUB IN CORN, OR LEATHER-JACKETS.

Twice I have written with fair fulness in the 'Transactions' regarding the larvæ of the Daddy Longlegs, the last time in the 'Transactions' of 1918. Scarcely a year passes without complaint from somewhere as to loss from these leather-jackets. For the past season or two the leather-jackets have been very troublesome in Arran and Bute and Ayrshire. I have been in correspondence with Mr M'Allister, a farmer in Arran, concerning his success against the leather-jackets with a dressing of Paris Green in powder form. Mr M'Allister's results were very favourable, and others from the West have told me of similar success. One correspondent gave me the formula:—

4 lb. Paris Green	} per acre to be treated.
56 lb. Bran	

The Paris Green and the bran were thoroughly mixed, and then damped with sufficient water to make the Paris Green adhere to the bran, but not wet enough to make the bran lumpy. This was then broadcast over the surface. The grub, greedy for the bran, poisoned itself by the arsenical Paris Green. My correspondent wrote of a field which came under his own observation. The first sowing of corn was completely destroyed by the leather-jackets, and the field had to be resown. The mixture named above was broadcasted before the second sowing had quite braired, and the end result was a good average braird of corn. At least nine out of every ten grubs found were dead and discoloured. The survivors were those that seemed never to have come out of the buried turf. Save for lateness in ripening (there had been delay in resowing), the subsequent growth of the crop was normal. In relation to what might happen in time with repeated dressings of Paris Green, my correspondent thought that, as the leather-jackets were only really troublesome after grass, 4 lb. of Paris Green to an acre of soil once in six to eight years would be insignificant.

In the West of Scotland Agricultural College the Agriculture Department has been giving attention to the use of Paris Green against the leather-jacket, and their last Report deserves quotation: "Excellent results have been obtained in the last two years in College experiments from the use of Paris Green (against the leather-jacket). The credit of putting this treatment into force in Scotland is due to Mr Thos. Hunter (the county instructor in agriculture and dairying in South Argyll), who in 1921 first applied it with good results to a neglected garden which was full of grub. Since then many successful trials have been carried out, especially during 1923

and 1924, in the College area, and, as a result of these, it would appear that we are on the way to obtain complete control of this pest.

"The method adopted by the College consists in thoroughly mixing 1 lb. Paris Green with 30 lb. of bran or thirds, and moistening the mixture with about 2 gallons of water. This gives a quantity sufficient for treating one acre.

"In the actual preparation an old tub or other receptacle may be used. Alternate layers of bran and Paris Green are placed in the bottom of the tub until the desired amount has been made up. The contents of the vessel are then thoroughly stirred, and finally, water is added until the mixture is sufficiently damped to cause the poison to adhere to the bran, and yet dry enough to sow with ease.

"Two teacups of treacle may be added to the water before it is mixed with the other ingredients. This sweetens the bait, and makes it more eagerly consumed by the grubs.

"Sowing of the Paris Green and bran can be done by hand in the absence of a suitable machine; it should be applied on the surface at or even prior to the first sign of attack. The best kill is generally obtained during warm moist nights, as the grubs appear to come to the surface in greater numbers under such conditions. Most of the destruction is effected in the first day or two after application. One might expect that birds would suffer from picking up poisoned bait, but so far there is no evidence of this occurring.

"The cost is not formidable: 1 lb. of Paris Green at 3s., 30 lb. bran at 3s. 6d.—6s. 6d. per acre. If the proportions are diluted to one part Paris Green to fifty parts of bran, as the results of some of the experiments seem to show, the cost could be proportionately reduced."

MILK RECORDS.

TWENTY-SECOND YEAR—RECORDS OF 27,957 COWS.

By **WILLIAM STEVENSON, B.Sc., N.D.A., N.D.D.**, Superintendent,
The Scottish Milk Records Association.

SYSTEMATIC milk recording in Scotland was continued in 1924 under the direction of the Scottish Milk Records Association on the same lines as in 1923 and previous years ; and a new scheme of private or unofficial milk records for unregistered herds was successfully inaugurated during this year.

The Association in 1924 consisted of the following members :

Name and Address.	Body Represented.
Mr Thos. Barr, Hobsland, Monkton . .	Central and South Ayrshire Milk Recording Society (5 Circuits).
Mr William D. M'Cubbin, Lochlands, Maybole	
Mr Colin Thomson, Brae of Auchendrane, Ayr	
Mr William D. Wardrop, Rigg, Auchinleck .	
Mr Andrew Wilson, Finlayston, Ochiltree .	
Mr George Templeton, Carnell Farm, Hurlford	Central Ayrshire No. 2 Milk Recording Society. Dumbartonshire Milk Recording Society.
Mr Alex. Y. Allan, Aitkenbar, Dumbarton .	
Mr William Ferguson, Catlins, Lockerbie .	Dumfriesshire Milk Recording Society (4 Circuits).
Mr Alex. Kirkpatrick, Stepends, Thornhill .	
Mr Robt. Millar, Shawsholm, Closeburn .	
Mr Mungo Sloan, Douglashall, Ecclefechan .	
Mr Andrew Hamilton, Kessington, Bearsden	
Mr James Mitchell, Wamphray, North Berwick	East Kilbride and District Milk Recording Society.
Mr Robt. M. Reid, The Glen Farm, Falkirk	East Lothian Milk Recording Society.
Mr William T. Dunlop, Gree, Fenwick .	East Stirlingshire Milk Recording Society.
Mr William M'Adam, Athronhall, Milnathort	Fenwick (High) Milk Recording Society.
Mr James W. Miller, Lochhead, West Wemyss	Fife Milk Recording Society (2 Circuits).
Mr D. F. Mackenzie, of Parks, Inverness .	
Mr Donald Gillespie, Craigs, Gruinart .	Highland Milk Recording Society.
Mr Robert Young, Drum, Kilkenzie . .	Islay Milk Recording Society.
Mr Andrew Craig, Ryesholm, Dalry . .	Kintyre Milk Recording Society.
	"John Speir" Milk Recording Society.

Name and Address.	Body Represented.
Mr Gavin Hamilton, British Linen Bank, Lesmahagow	Lesmahagow Milk Recording Society.
Mr Andrew M'Candlish, Claunch, Sorbie .	} Lower Wigtownshire Milk Recording Society (2 Circuits).
Mr Alexander M. Owen, Culnoag, Sorbie .	
Mr James Seton, Shewalton Mains, Irvine .	Montgomerie Milk Recording Society.
Mr John A. Carlyle, B.Sc., 2 Addison Place, Arbroath	North of Scotland Milk Recording Society.
Mr George Buchanan, Hunterhill, Paisley .	} Renfrew and Bute Milk Recording Society (2 Circuits).
Mr Robert M'Alister, Mid Ascog, Rothesay	
Mr William Howie, Carnwadric, Thornliebank	Renfrewshire (Upper Ward) Milk Recording Society.
Mr Andrew Cochran, High Ardwell, Kirkcolum, Stranraer	} Rhins of Galloway Milk Recording Society (4 Circuits).
Mr T. R. Evans, Alton, Drummore, Stranraer	
Mr John Forster, Mains of Larg, New Luce	} Roxburgh and District Milk Recording Society.
Mr Alex. N. M'Caig, Challoch, Stranraer .	
Mr Andrew Rutherford, Pinnacle, Ancrum .	} Stewarton and Dunlop Milk Recording Society.
Brig.-Gen. J. A. Houson-Craufurd, Dunlop House, Dunlop	
Mr H. G. Baird, Kirkchrist, Kirkcudbright	} Stewartry of Kirkcudbright Milk Recording Society (4 Circuits).
Mr H. W. B. Crawford, Forneth, Castle-Douglas	
Major C. R. Dudgeon, Cargen Holm, Dumfries	
Mr William P. Gilmour, Balmangan, Borgue	
Mr John Crooks, Little Ochiltree, Uphall .	West Lothian Milk Recording Society.
Lt.-Col. W. T. R. Houldsworth, of Kirkbride, Maybole	} The Ayrshire Cattle Herd - Book Society of Great Britain and Ireland.
Mr James Howie, Hillhouse, Kilmarnock .	
Mr Thomas C. Lindsay, Aitkenbrae, Monkton	} The British Friesian Cattle Society.
Mr A. W. Montgomerie, Lessnessock, Ochiltree	
Mr Matthew Bowie, Balmuildy, Maryhill, Glasgow	} The Shetland Cattle Herd-Book Society.
Mr Alexander Munro, of Dell of Inches, Inverness	
Mr T. J. Anderson, Cairnfield, Lerwick .	} The Highland and Agricultural Society of Scotland.
Mr A. B. Garriock, Greenfield, Lerwick .	
Mr Charles M. Douglas, C.B., D.Sc., of Auchlochan, Lesmahagow	
Mr John M'Caig, Belmont, Stranraer .	
Sir Hugh Shaw Stewart, Bart., C.B., of Ardgowan, Inverkip	

Name and Address.	Body Represented.
Mr Charles M. Douglas, C.B., D.Sc., of Auchlochan, Lesmahagow	The West of Scotland Agricultural College.
Mr T. C. Lindsay, Aitkenbrae, Monkton	
Principal W. G. R. Paterson, 6 Blythwood Square, Glasgow	
Mr Harry Armour, Niddry Mains, Winchburgh	The Edinburgh and East of Scotland College of Agriculture.
Mr Alexander Lauder, D.Sc., 13 George Square, Edinburgh	
Major T. Blackburn, 13 George Square, Edinburgh	
Mr G. G. Esslemont, M.B.E., B.Sc., 41½ Union Street, Aberdeen	The North of Scotland College of Agriculture.
Professor J. Hendrick, Marischal College, Aberdeen	
Mr J. F. Tocher, D.Sc., 41½ Union Street, Aberdeen	
Mr Robert Dickie, of Messrs J. & W. Wallace, 498 Gallowgate, Glasgow	Co-opted Members.
Mr John Drysdale, 5 St Andrew Square, Edinburgh	
Mr James Dunlop, Board of Agriculture for Scotland, Edinburgh	
Mr George Hobson, 4 Southampton Row, London, W C 1	
Mr Robert Laird, Lawthorn, Irvine	

Chairman—Mr William P. Gilmour

The following were the principal members of the staff :—

Secretary and Treasurer—Mr John Howie.

Superintendent—Mr William Stevenson, B.Sc., N.D.A., N.D.D.

Assistant Superintendent—Mr Percy H. Hart.

SCHEME OF OFFICIAL MILK RECORDS.

ADMINISTRATION.

In 1924, as in previous years, the scheme of official milk records was administered by the Association through local Milk Recording Societies. The grant from the Development Fund, obtained through the Board of Agriculture for Scotland, was continued in 1924 on the same conditions as in the previous year. The grant authorised for 1924 amounted to approximately £3500.

The Ayrshire Cattle Herd-Book Society continued their grant of £50 to the Association.

Grants were allocated to local societies on the following scale :—

1. Societies testing at intervals of not more than twenty-one days :—

- (a) The hire of the necessary milk-testing appliances free of annual charge, the society to upkeep the apparatus in good condition.
- (b) An annual grant of 50s. to each new member in his first or second year, and of 15s. to each member in his third or fourth year.
- (c) An annual grant of 14s. per member towards the cost of surprise check tests.

2. Societies testing at intervals of from twenty-two to twenty-eight days :—

- (a) The hire of the necessary milk-testing appliances free of annual charge, the society to upkeep the apparatus in good condition.
- (b) An annual grant of 30s. to each new member in his first or second year, and of 15s. to each member in his third or fourth year.
- (c) An annual grant of 12s. 6d. per member towards the cost of surprise check tests.

During the latter part of 1923 recording was suspended in nine circuits as a result of the unfortunate outbreaks in Scotland of foot-and-mouth disease. But special efforts were made to obtain additional applications for membership of local societies in 1924 throughout the various dairying districts of Scotland, and 118 definite applications were received. The wide prevalence of foot-and-mouth disease caused a number of intending members to postpone milk recording for another year at least, and led to more than the usual number of resignations. But, instead of diminishing, the disease continued to extend rapidly in Scotland during the early months of 1924, and no fewer than 21 circuits deemed it advisable to suspend milk recording for a period. A number of milk record herds became infected and were slaughtered or isolated, and the effect on organised milk recording at one time threatened to be disastrous.

Notwithstanding these difficulties, 38 local societies or circuits of 1923 resumed recording in 1924, and two new local societies were formed—namely, the Kintyre Society and the Islay Society. The number of circuits was 40, the same number as in the previous year; the number of herds officially tested was 703, and the number of cows officially tested 27,957. Under the circumstances, it is gratifying to find so many herds officially recorded during the year.

The following is a list of the Milk Recording Societies which operated in 1924, with the name and address of the secretary of each society :—

Name of the Society.	Secretary.
Central and South Ayrshire (5 Circuits)	Mr E. A. Bell, M.A., B.Sc., 239 High Street, Ayr.
Central Ayrshire No. 2 .	Mr James Cochrane, N.D.A., Holmes Farm, Kilmarnock.
Dumbartonshire . . .	Mr John Bilsland, Quay Place, Dumbarton.
Dumfriesshire (4 Circuits)	Mr Thomas Henderson, Solicitor, Lockerbie.
East Kilbride and District	Mr Arthur Gilmour, 11-13 Macfarlane Street, Glasgow.
East Lothian	Mr James L. Nisbet, Easter Newton, Kirknewton.
East Stirlingshire . . .	Mr Robert M. Reid, The Glen Farm, Falkirk.
Fenwick (High). . . .	Mr James Mather, Low Gainford, Fenwick.
Fife (2 Circuits) . . .	Mr William Macniven, Royal Bank, Kirkcaldy.
Highland	Mr J. M. Hunter, Queensgate, Inverness.
Islay	Mr D. M'Millan, Eorrabus, Bridgend.
"John Speir"	Mr William Longwill, Hawhill, Dalry.
Kintyre	Mr Robert Young, Drum, Kilkenzie.
Lesmahagow	Mr Gavin Hamilton, British Linen Bank, Lesmahagow.
Lower Wigtownshire (2 Circuits)	Mr David Breckenridge, Solicitor, Newton-Stewart.
Montgomerie	Mr Robert Laird, Lawthorn, Irvine.
North of Scotland . . .	Mr John A. Carlyle, B.Sc., 2 Addison Place, Arbroath.
Renfrew and Bute (2 Circuits)	Mr Thomas Hunter, Solicitor, 24 High Street, Paisley.
Renfrewshire (Upper Ward)	Mr William Henderson, Old, Crookston, Nitshill.
Rhins of Galloway (4 Circuits)	Mr John Gibson, Solicitor, Stranraer.
Roxburgh and District .	Colonel A. Hadden, Solicitor, Hawick.
Stewarton and Dunlop .	Mr R. Miller, Wardlaw, Kilwinning.
Stewartry of Kirkcudbright (4 Circuits)	Mr Patrick Gifford, Solicitor, Castle-Douglas.
West Lothian	Mr John Crooks, Little Ochiltree, Uphall.

SEASON 1924.

The table on the following page shows for each society the number of herds, the number of cows tested, the average interval between the tests, and the duration of the recording season :—

[TABLE

Name of the Society or Circuit.	No. of Herds.	No. of Cows Tested.	Average interval between Tests, in Days.	Duration of Recording Season, in weeks.
Central and South Ayrshire—				
1. Ayr and Monkton	17	653	21	52
2. Cumnock and Auchinleck	16	401	21	52
3. Girvan and Maybole	15	658	21	52
4. Kilmarnock, Galston, & Newmilns	17	655	21	52
5. Mauchline and Ochiltree	16	496	21	52
6. Central Ayrshire No. 2	14	466	21	52
7. Dumbartonshire	21	626	28	52
Dumfriesshire—				
8. Lower Annandale	19	858	25	52
9. Upper Annandale	19	736	25	52
10. Lower Nithsdale	18	764	25	52
11. Upper Nithsdale	20	810	25	52
12. East Kilbride and District	14	542	21	52
13. East Lothian	17	331	21	52
14. East Stirlingshire	20	595	26	52
15. Fenwick (High)	19	625	25	52
Fife—				
16. Dunfermline and Kirkcaldy	20	741	28	52
17. Cupar-Fife and Perth	18	407	25	52
18. Highland	21	529	28	52
19. Islay	8	234	23	33
20. "John Speir"	18	506	24	52
21. Kintyre	20	821	28	52
22. Lesmahagow	19	516	28	52
Lower Wigtownshire—				
23. Whithorn and Port William	18	1021	24	52
24. Newton-Stewart and Wigtown	17	916	23	52
25. Montgomerie	16	488	28	52
26. North of Scotland	19	415	28	52
Renfrew and Bute—				
27. Bute and Inverkip	15	462	21	52
28. Paisley and Kilmacolm	22	602	28	52
29. Renfrewshire (Upper Ward)	16	667	21	52
Rhins of Galloway—				
30. Kirkcolum and District	16	1145	25	52
31. Kirkmaiden and District	13	1152	27	52
32. Luce Valley	17	982	24	52
33. Stranraer and District	17	1190	25	52
34. Roxburgh and District	16	515	21	52
35. Stewarton and Dunlop	15	438	21	52
Stewartry of Kirkcudbright—				
36. Dalbeattie and New Abbey	20	991	28	52
37. Castle-Douglas & New Galloway	21	1232	28	52
38. Kirkcudbright and District	20	1237	28	52
39. Borge, Twynholm, & Gatehouse	21	1063	28	52
40. West Lothian	16	472	21	52
Unattached Members	2	17	21	52
Total No.	703	27,957	...	...

DEFINITIONS.

The milk records compiled by the Association are records of the estimated quantity of milk produced by each cow in a separate lactation, and of the estimated percentage of milk fat contained in the milk. For convenience a gallon of milk was reckoned as 10 lb. A gallon of milk of average quality weighs almost exactly $10\frac{1}{2}$ lb. The following further particulars concerning each record were also given, wherever possible :—

Name of cow, byre number, and herd-book number.

Sire of cow, and herd-book number of sire.

Dam of cow, and herd-book number of dam.

Date of birth.

Date of calving preceding opening of record.

Number of weeks in milk.

Date of next calving after record closed.

The following particulars of the preceding record were appended to each record, where available :—

Date of calving preceding opening of record.

Quantity of milk in gallons.

Percentage of fat in milk.

Number of weeks in milk.

The milk yields were estimated in respect of quantity and milk fat percentage from the results of systematic periodic tests by trained recorders approved by the Association. The recorders visited the farms for this purpose at intervals varying from fourteen to twenty-eight days, and each day of visit was regarded as the middle day of the period covered by the visit. Milk records estimated in this way approximate closely to the actual milk yields.

METHOD OF RECORDING ADOPTED—OFFICIAL RECORDS.

A distinctive feature of milk recording in Scotland in 1924, as in former years, was that the official records were entirely the work of trained official recorders. Recorders had previously to undergo a special course of training in milk recording at the Dairy School for Scotland, at Kilmarnock, or other approved College of Agriculture. Only candidates of good character and good general education were selected to attend these courses; and all recorders, before appointment, were approved by the Executive Committee of the Association.

Fuller details of the method of recording adopted will be found in last year's report. The byre sheets were written out in duplicate. The principal copies were posted at regular intervals to the offices of the Association, and the carbon copies left with the respective members. The recorder transferred the results from the extended byre sheet to the milk record book for the herd indelibly in ink, each cow being assigned a separate page, at the top of which full particulars of the cow were entered, including the indelible tattoo marks on the animal.

All byre sheets were carefully revised and corrected in the Association's offices during the season, and a list of the necessary corrections sent to each recorder periodically to be entered in the record books.

Visits of inspection were made to each recorder and to the members of local societies at the different farms periodically throughout the year by members of the Association's staff, and reports thereon submitted to the Executive Committee. The Executive Committee reserved the right to withdraw approval of any recorder at any time or to limit the period of service of any recorder with any particular society. Members of local societies refusing to observe any of the rules of the Association, or deemed to be guilty of conduct injurious to the true interests of milk recording, were liable to be temporarily or permanently suspended.

Another distinctive feature was the surprise check tests, the records of each herd being checked in this way about two or three times throughout the year. The recorder was instructed, by a letter from the superintendent on a date unknown to recorder and owner of herd, to remain at the same farm another day and make another complete twenty-four hours' test. The surprise test results were entered on special buff-coloured byre sheets, and in the record books in red ink immediately below the results of the regular test of the previous day. The buff byre sheets were posted to the Association's offices with the other sheets, and any abnormal differences were immediately noted and reported to the Executive Committee.

As a result of this system of surprise check tests, each page of the 1924 milk record books contains two or three lines of entries in red, comparison of which with the immediately preceding entries provides valuable evidence as to the genuineness of the milk records.

In addition to the surprise check tests made by the recorder, a number of independent surprise tests were made by the Association's staff, in order to check the recorders' work.

All records were closed at the end of December, the current lactations being carried forward to the new books of the

following year. Finally, summary sheets were written out in duplicate showing the total milk yields for each cow for the lactation or part lactation, with full particulars of the cow, dates of calving, &c. The principal copy of the summary sheet was posted to the Association's offices with the record book, and the second copy left with the owner of the herd.

All record books and summary sheets were carefully revised, corrected in detail, and initialled in the Association's offices during the next few months, the record books being returned later to the respective members, and the summary sheets retained and bound for future reference.

The milk records were next classified into three groups for cows and heifers respectively, on the following basis. Experience has confirmed the view that a very useful comparison is obtained by reckoning the yields at their estimated equivalent of milk of 1 per cent fat. Such a comparison takes into consideration both the quantity and the quality of the milk.

Cows with a milk record equivalent to not less than 2500 gallons at 1 per cent fat, and heifers with a milk record equivalent to not less than 2000 gallons at 1 per cent fat, were grouped into Class I. Cows and heifers with milk records of less than two-thirds of these amounts—viz., 1660 and 1330 gallons respectively—were grouped into Class III.

The following short table shows the corresponding values of these yields in fairly good milk of 3·5 per cent milk fat :—

Class.	Yield in Milk of 1 per cent Fat. (Gallons.)	Corresponding Yield in Milk of 3·5 per cent Fat. (Gallons.)
Cows in Class I . .	Not less than 2500 . .	714
Heifers in Class I. .	Not less than 2000 . .	571
Cows in Class III. .	Less than 1660 . .	474
Heifers in Class III. .	Less than 1330 . .	380

All cows and heifers falling between these limits would come into Class II. Such animals naturally claim less attention than the good milkers or the obviously unprofitable animals. It should be noted, however, that Class II. would include a certain number of unclassified yields, as there were a number of instances where, from various causes, the results of a whole normal lactation could not be obtained.

The Association will shortly publish an Annual Report giving all details of the work of the Association, and of each local Milk Recording Society during 1924. This report will include tables showing for each farm the number of cows and heifers tested and the number and percentage included

in Classes I. and III. respectively. Each herd is included under the respective local society, but is represented only by an alphabetical letter, the owner being advised privately of the identity in the report of his own herd or herds. From these tables any member may see at a glance how his herd compares with other herds in the same or any other district, and the improvement in his own herd compared with previous years. The report will also show in tabular form the percentage of Class I. and Class III. animals of all animals tested under the Association's scheme during the year, and will thus afford a valuable indication of the progress in milk production generally.

An important feature of the Association's Annual Reports from 1917 inclusive is the register of good milking cows with the names and addresses of owners and full particulars of the milk records. This register includes only milk records eligible for Class I., and is further restricted to animals which completed their lactation before the end of the year and gave birth to another calf before 1st May of the year following. The fullest available particulars of each record are given, and all lists of records are submitted to the owners of the respective animals for revision before publication. The register is of great value to all interested in increased milk production and in the breeding and rearing of animals of the best milking strains, and is invaluable for reference.

It should always be kept in mind when making a comparison of cows in different herds or in different districts, that the different methods of dairying practised have a considerable influence on the milk yields, and that therefore milk yields alone do not necessarily indicate the true relative inherent or hereditary milking qualities of the animal. But the authenticated milk records compiled by the Association are of inestimable value to breeders and owners of dairy cows if properly interpreted.

REVIEW OF 1924—OFFICIAL RECORDS.

Official recording was carried on in 1924 by 40 local societies or circuits, comprising 703 members, the same number as in the previous year. The number of cows tested in 1924 was 27,957, compared with 26,952 in 1923. In view of suspension or postponement of recording by many herd owners owing to foot-and-mouth disease in the districts it is gratifying to find so many herds officially recorded.

During the year 15 recorders, for various reasons, terminated their engagements. The Executive Committee, however, in the same period approved of 16 applicants for the position of milk recorder, and were able to recommend

a sufficient number of qualified recorders. Fourteen women recorders were employed in 1924 and 37 men recorders.

In this connection the Committee, as formerly, were indebted to the West of Scotland Agricultural College for giving special courses of instruction for milk recorders to meet the Association's requirements. Only one special course was required in 1924,—namely, in December. Sixteen selected candidates attended this course, and 14 obtained the certificate.

The Executive Committee were able to purchase sufficient supplies of milk-testing apparatus, sulphuric acid, and amyl alcohol for local societies at prices similar to those of 1923.

The system of surprise check tests, introduced in 1920, was continued in 1924. The total number of check tests made by recorders during the season was 1177, or an average of approximately two check tests per herd tested throughout the whole season. In no instance in 1924 was the average milk yield for the herd more than 3 lb. milk daily less on the occasion of a check test, as compared with the previous day. Only three herds showed an average of over $2\frac{1}{2}$ lb. less; and only 7 herds an average of over 2 lb. less, including the two herds already referred to. In addition to the surprise check tests arranged for and carried out by the recorders, the Assistant Superintendent made 44 special check tests of different herds. The results, in most instances, agreed very closely in regard both to average milk yield and fat percentage with those of the recorders' previous tests. Only five herds showed an average daily yield of from 2 to 3 lb. less on the occasion of a special check test; 5 herds had an average of from 2 to 3 lb. more. With regard to average fat percentages, the greatest difference in either direction was .44 per cent. Only two herds showed an average fat percentage of over .3 per cent lower, and one herd an average of over .3 per cent higher.

With regard to the general conditions for milk production in 1924, the most outstanding feature was the long spell of broken weather that prevailed in most districts from May to October. The rainfall during these months was abnormally heavy and the record of sunshine was exceptionally low. These conditions were not unfavourable in districts where the soil was of a drier and more porous nature, but in other districts had a distinctly prejudicial effect. Though pasture was plentiful the excessively wet conditions rendered the grass soft and deficient in feeding value and of inferior quality generally. Dairy cows have often done better in seasons when the grass was much less plentiful.

In the case of recorded herds, several other conditions in 1924 militated against a higher average recorded milk yield. A very considerable number of herds which had been recorded for a period of years were entirely dispersed, or for other

reasons did not continue to be recorded, while a proportionately large number of "new herds," or herds tested for not more than three years, were included. The proportion of regular "milk record herds" was thereby correspondingly reduced. The 703 herds tested in 1924 included 49 herds in their fourth year, 83 herds in their third year, 54 herds in their second year, and 63 herds in their first year.

As already stated the unfortunate outbreaks and serious spread of foot-and-mouth disease among dairy herds in Scotland in 1923-24 caused milk recording to be suspended on no fewer than 21 out of 40 circuits for periods varying from 1 to 19 weeks, with a consequent reduction in the number of cows tested and curtailment of the length of many recorded lactations. A very considerable number of animals failed to reach the Class I. standard in 1924 for this reason alone.

The following table shows for each society or circuit the number and percentage of cows and heifers of each class in 1924, with a comparison of the average results from 1914 to 1924 inclusive:—

Society or Circuit	Cows and Heifers				
	Number.			Per Cent.	
	Total.	Class I.	Class III.	Class I	Class III
Central and South Ayrshire—					
1 Ayr and Monkton . . .	653	214	6	75*	2*
2 Cumnock and Auchinleck . .	401	95	3	63*	2*
3. Girvan and Maybole . . .	658	378	27	57	4
4. Kilmarnock, Galston, and } Newmilns	655	413	37	63	6
5. Mauchline and Ochiltree . .	496	240	2	77*	1*
6. Central Ayrshire No. 2 . . .	466	246	6	72*	2*
7. Dumbartonshire . . .	626	409	11	71*	2*
Dumfriesshire—					
8. Lower Annandale . . .	858	633	13	74	2
9. Upper Annandale . . .	736	500	31	68	4
10. Lower Nithsdale . . .	764	397	32	56*	5*
11. Upper Nithsdale . . .	810	474	37	59*	5*
12. East Kilbride and District . .	542	308	35	57	6
13. East Lothian . . .	331	276	3	85*	1*
14. East Stirlingshire . . .	595	363	13	63*	2*
15. Fenwick (High) . . .	625	109	2	76*	1*
Fife—					
16. Dunfermline and Kirkcaldy .	741	574	17	77	2
17. Cupar-Fife and Perth . . .	407	284	12	70	3
18. Highland . . .	529	380	15	73*	3*

Society or Circuit.	Cows and Heifers.				
	Number.			Per Cent.	
	Total.	Class I.	Class III.	Class I.	Class III.
19. Islay	234	8	50	4*	23 ¹
20. "John Speir"	506	290	13	61*	3 ¹
21. Kintyre	821	356	40	43	5
22. Lesmahagow	516	387	5	77*	1 ¹
Lower Wigtownshire—					
23. Whithorn and Port William	1021	599	52	59	5
24. Newton-Stewart and Wigtown	916	378	84	41	9
25. Montgomerie	488	337	28	69	6
26. North of Scotland	415	370	...	92*	...
Renfrew and Bute—					
27. Bute and Inverkip	462	256	28	55	6
28. Paisley and Kilmacollm	602	378	19	68*	3 ¹
29. Renfrewshire (Upper Ward)	667	356	28	53*	4 ¹
Rhins of Galloway—					
30. Kirkcolum and District	1145	701	32	61	3
31. Kirkmaiden and District	1152	776	24	66	2
32. Luce Valley	982	641	31	65	3
33. Stranraer and District	1190	911	16	76	1
34. Roxburgh and District	515	333	16	65	3
35. Stewarton and Dunlop	438	318	6	74*	1*
Stewartry of Kirkcudbright—					
36. Dalbeattie and New Abbey	991	602	31	63*	3*
37. Castle-Douglas and New Galloway	1232	821	25	67	2
38. Kirkcudbright and District	1237	744	37	62*	3*
39. Bogue, Twynholm, and Gatehouse	1063	671	23	68*	2*
40. West Lothian	472	312	17	66	4
Unattached Members	17	5	2	50*	2*
Of all the cows and heifers tested in 1924	27,957	16,843	909	65*	3*
Comparison with 1923	26,952			65	2
Comparison with 1922	27,275			63	2
Comparison with 1921	26,752			58 ¹	4
Comparison with 1920	24,191			55 ¹	3 ¹
Comparison with 1919	20,786			49 ¹	4 ¹
Comparison with 1918	17,827			49	5 ¹
Comparison with 1917	19,564			50	4 ¹
Comparison with 1916	22,702			53 ¹	4 ¹
Comparison with 1915	26,572			46	6
Comparison with 1914	26,424			39 ¹	9

Excluding herds tested during only a part of the recording season (owing mainly to foot-and-mouth disease)—1949 cows in all.

Reviewing the results of the 40 circuits as a whole, we find that of the total of 27,957 cows and heifers tested in 1924, excluding 1949 animals in herds tested during only a part of the season, owing mainly to foot-and-mouth disease, and therefore not classified, 16,843 were included in Class I., and only 909 in Class III. This is equivalent to 65 per cent in Class I., and 3 per cent in Class III. Thus, 65 per cent of all the cows and heifers tested gave a milk yield equivalent to not less than 714 gallons containing 3·5 per cent milk fat in the case of a cow, and 571 gallons in the case of a heifer; while only 3 per cent gave a milk yield equivalent to less than 474 gallons containing 3·5 per cent milk fat in the case of a cow, and 380 gallons in the case of a heifer. In 1923, 65 per cent were eligible for Class I., and 2 per cent were included in Class III.

The average standard attained in 1924 was undoubtedly lowered by the inclusion of the large proportion of new herds and by the adverse weather conditions already referred to, yet it will be observed from the preceding table that the proportion of animals qualifying for inclusion in Class I. in 1924 is the largest in the history of milk recording in Scotland.

This result is most encouraging to all interested in the work. The position maintained in 1924 owed nothing to improved conditions, but rather the reverse, and provides further evidence of a definite improvement from year to year in the inherent or hereditary milking qualities of the herds tested. The proportion of Class I. cows and heifers has been increased from 39½ per cent in 1914 to 65 per cent in 1924. This improvement, in a total of 28,000 cows, represents an enormous increase in the volume of milk produced by recorded herds in Scotland. Nor is improvement confined to herds actually recorded, as stock bulls off the best milking strains in the better known milk record herds are widely disseminated annually among untested herds, and a large number have been exported. Such bulls have undoubtedly a great improving influence on the dairy herds of the country generally.

Unfortunately, the costs of production of milk relatively to the prices obtainable for milk and milk products have also increased during recent years, until a point has been reached at which it is evident that even good-milking cows are yielding at the best only a small profit; and practically all the advantages of milk recording are absorbed in balancing the adverse conditions existing in the industry. This position is clearly reflected in the abnormally large number of dispersal sales of dairy herds, including milk record herds. Probably, never was there greater need of every possible assistance, in the form of public grants for milk recording purposes, and otherwise, for the dairy farmer in his efforts to maintain

the milk-producing industry on an economic basis. And herd owners should in their own interests hesitate no longer in adopting systematic milk recording as the most effective means yet applied of improving the standard and reducing the cost of milk production.

Assuming the number of milking cows of the recognised dairy breeds in Scotland to be approximately 200,000, the proportion officially recorded in 1923 and 1924 was approximately 14 per cent; the corresponding figure for Denmark has been given officially as about 25 per cent; but when the herds under the Association's New Scheme of Unofficial Records are included the proportion for Scotland is about 15 per cent.

NEW SCHEME OF PRIVATE OR UNOFFICIAL MILK RECORDS.

The Association's New Scheme of Private or Unofficial Milk Records was formally sanctioned by the Treasury and approved by the Development Commissioners and the Board of Agriculture for Scotland in January 1924, and was put into operation without delay. The total grant for 1924 was limited to £325.

The chief objects of the scheme are to establish milk recording on a wider and more popular basis, and to induce a greater number ultimately to adopt the system of official authenticated milk records.

Milk recording under this scheme was administered directly by the Association. The following inducements were offered to members :—

- (a) The hire of a set of appliances for testing purposes, free of annual charge, the member to upkeep the apparatus in good condition.
- (b) Byre sheets and record books free of charge, with stamped addressed envelopes for return of byre sheets.
- (c) All calculations in byre sheets and record books to be made in the Superintendent's office, and the sheets and record books to be returned to the herd owners duly extended and completed.
- (d) The total charge on members to be limited to an annual subscription to the Association at the rate of 1s. 6d. per cow tested.

The late date on which the scheme was approved prejudiced to some extent the successful launching of the new scheme so far as season 1924 was concerned, as there was not sufficient time to carry through the necessary propaganda work to obtain members before the recording season com-

menced. The increased charge, at the rate of 1s. 6d. per cow in place of 6d. per cow as recommended by the Association, has also proved a severe handicap in all efforts to make the scheme popular among the rank and file of dairy farmers.

The measures adopted to obtain members included press advertisements, propaganda articles in the press, and personal canvassing; but reliance was placed mainly on circular letters with propaganda literature posted direct to herd owners. Through the instrumentality of milk recorders, members of local milk recording societies, &c., as complete a list as possible of herd owners in Scotland likely to be interested in the scheme was compiled; and each of these was directly approached by circular letter with propaganda literature and full particulars of the scheme.

Before the recording season was far advanced, 80 members, with a total of approximately 1720 cows, were enrolled, while a further number intimated their intention to enrol for season 1925. Two herds were withdrawn before recording actually commenced; in one instance owing to the death of the owner, and in the other on account of illness of the farmer concerned; while two herds were transferred to the scheme of official records after a very short period of recording. The total number of herds tested during the year was 76, and the total number of cows tested, 1636, an average of 22 cows per herd.

The following is a brief outline of the method of recording adopted:—

All cows in the herd yielding milk must be included in the record. Each cow must be clearly distinguished in the byre by a stall number on the wall. On the occasion of a test the cows must be milked in the same rotation evening and morning, and care must be taken that the milk of each cow for twenty-four hours, and for twenty-four hours only, is included in the test. The owner, or his agent, is required to weigh the milk of each cow evening and next morning, by means of the spring balance and pail provided, once every 21 to 28 days; and to enter the results and other necessary particulars in the byre sheet provided by the Association; and each byre sheet must be signed by the owner, or on his behalf, as correct in respect of all entries made. The byre sheet is sent by first post to the Superintendent, and calculated and extended by the Association's staff, and returned to the owner as soon as completed. A milk record book for each herd is written out in the Association's office. The record books are closed at the end of the recording season as at 30th November, and the results summarised and entered in special summary sheets. The record books and copies of the summary sheets, when completed and checked, are sent to the respective owners of the herds.

It must, of course, be clearly understood that the milk records compiled under this scheme are purely unofficial unauthenticated records, and have no connection with the official authenticated milk records of the Association.

On the whole, members under this scheme have throughout this, the first year of operation, carried out their obligations very satisfactorily. The milk has been weighed and the byre sheets posted to the Association's office with great regularity ; and a number of letters have been received from, and opinions expressed by, members indicating that they have already obtained very useful guidance from the records. A number of the first-year members have recommended the scheme to other farmers, and have assisted in this and other ways in obtaining new members.

Experience already gained would indicate that if the rate of annual subscription could be reduced to the figure originally proposed—namely, 6d per cow,—the new scheme of unofficial milk records would be likely to fulfil the objects for which it was promoted.

PROSPECTS FOR 1925.

Further efforts were made to obtain additional applications for membership of local societies in 1925. With the new scheme of private or unofficial milk records now in operation it was possible to carry out propaganda work for both schemes simultaneously, and considerably over 3000 circulars and other letters with propaganda literature giving particulars of both schemes of recording and forms of application were distributed to over 1600 dairy herd owners throughout Scotland, whose names and addresses had been compiled locally and forwarded to the Superintendent. Applications were invited also through press advertisements, articles, &c., and members of the Association and all recorders were requested individually to endeavour to obtain new members for either scheme in their respective districts. In addition, no fewer than 1398 personal visits were made by the Association's staff in an endeavour to obtain new members through the various dairying districts of Scotland. But the severe depression in dairy farming which has existed for several years is evidently having a cumulative effect on herd owners, who are seeking to cut down expenditure in every possible direction, and there would appear to be more than the usual difficulty in persuading them to adopt any new scheme entailing the slightest additional expenditure. The number of new applications for official records for season 1925 obtained was 87, and a number of prospective members for 1926 have also been obtained.

All the local societies of 1924 have continued in 1925 ;

many of them with the maximum membership, and an additional recorder's circuit (circuit No. 5) has been formed in Kirkcudbrightshire. The number of herds officially tested in 1925 should be approximately 720, and the number of cows officially tested proportionately increased to about 29,000.

With regard to unofficial records, the number of new members for 1925 obtained at time of writing is 90, with approximately 2493 cows, and these have all been supplied with the necessary milk-weighing apparatus and stationery, and in most cases have already commenced recording. Sixty-six of the 76 members of 1924 have continued, so that the total membership for 1925 is at present 156, and the total number of cows unofficially tested, taken from enrolment forms, will be very approximately 3945, an average of 25 cows per herd.

The total number of herds recorded officially or unofficially in 1925 will be very approximately 875, compared with 778 in 1924, an increase of 97 herds, or $12\frac{1}{2}$ per cent.

GENERAL REVIEW.

In any scheme of work where statistics are the chief object, as in milk records, it is most important that there should be the fullest confidence in the methods employed and in the results tabulated; and it is well that methods, and particularly changes in method, should be reviewed from time to time in the light of experience gained. All in any way connected with milk recording will be closely interested in research work recently carried out by A. C. M'Candlish, M.S.A., Research Officer in Milk Production to the West of Scotland Agricultural College, in which he had the assistance of A. M'Vicar, B.Sc., to ascertain the value of the records of the Scottish Milk Records Association as compared with the actual production of the animals. We can only refer very briefly here to the results of this investigation. We are indebted to Mr M'Candlish for permission to make use of his report, which will be published in full elsewhere.

It is not practicable for a milk recording society to weigh and test officially the milk of every cow in a commercial herd daily; for the sake of economy this is done only at stated intervals, and the milk records obtained are estimated records for all the cows in test, and not the actual yields of milk and milk fat produced by the animals. It is, therefore, well to have a definite idea of the degree of accuracy of the official records obtained.

The records of a herd where the milk of all cows was weighed at each milking were obtained, and the records of all cows calving in 1920 and remaining in the herd until they completed

their lactations were used in the investigation. The estimated records were obtained by two methods. In making the estimation, the first test of the lactation was put on a day taken at random, and the subsequent tests were taken at 10, 20, and 30 days' interval respectively.

The two methods of estimation studied have been used by the Scottish Milk Records Association, and are termed the "old" and "new" methods. The old method was used until the end of 1914, while the new method has been in use since that time. The official instructions for applying the two methods of calculation are as follows:—

Old Method.—For the first test of a lactation multiply the total quantity of evening and morning milk from each cow by the number of days which have elapsed since the cow calved, and on the second and each succeeding test multiply the quantity of milk by the actual number of days which have elapsed since the last test.

New Method.—For the first test of a lactation multiply the total quantity of evening and morning milk from each cow by the number of days which have elapsed since the cow calved, plus half the number of days in the average interval between tests. On the second and each succeeding test multiply the quantity of milk by the actual number of days which have elapsed between tests, thus regarding each day of test as the middle day of the period covered by the test.

The following abbreviated table shows the average yields obtained by the different methods of calculation:—

Cow No	Actual Yield in Gallons	Estimated Yields					
		Old Method.			New Method		
		10 Days.	20 Days.	30 Days	10 Days	20 Days	30 Days
Average .	642	631	617	594	647	647	643

The results obtained by the old method by testing at 10, 20, and 30-day intervals are 631, 617, and 594 gallons respectively, as compared with the actual average of 642 gallons. These are decreases of 11, 25, and 48 gallons from the true average. It should be noted also that the decrease by 20-day intervals is more than double, and the decrease by 30-day intervals more than treble, that by 10-day intervals.

Comparing the records obtained by the new method at 10, 20, and 30-day intervals, the average records are 647, 647, and 643 gallons respectively, as compared with the true

average of 642 gallons. These are increases of 5, 5, and 1 gallons from the true average, and are differences of no practical importance, as all are variations from the true average of less than 1 per cent.

It is important to note not only the average results but also the variations obtained in calculating individual records by the various methods. Taking first the old method, with intervals of 20 days and 30 days respectively the variation from the true yield was always a decrease, and the maximum individual variation was as great as 65 gallons with 20-day intervals and 93 gallons with 30-day intervals. By the new method, with intervals of 20 days and 30 days respectively, the greatest individual variations were from a decrease of 32 gallons to an increase of 25 gallons in the case of the 20-day interval; and from a decrease of 36 gallons to an increase of 46 gallons in the case of the 30-day interval. Thus the greatest individual variation from the true yield was by the new method, 46 gallons, and by the old method, 93 gallons.

Practically all milk record society tests are conducted at intervals of from 20 to 28 days, and it should be emphasised that the reliability of the new method of calculating remains unchanged when the interval between tests is increased within these limits, while that of the old method is adversely affected. With the new method about the same number of individual records show an increase as show a decrease, and all results approximate very closely to the true records. On the other hand, when the old method of calculation is used all the records at 20 and 30-day intervals are less than the actual records, large variations up to about 100 gallons being obtained. In other words, the new method gives the cow an even chance, while the old method puts her under a handicap. The results are summarised by the investigators as follows:—

“On the whole the method at present in use for the calculating of records is very satisfactory and quite reliable.”

The new method of calculating milk records was recommended by us in 1914, and was adopted by the Association and introduced in 1915.

Systematic milk recording has become recognised as an essential development in all dairying countries seeking to make the most of their national resources. The methods in Scotland have been gradually adapted to requirements as experience indicated, until a dual system has been evolved which is regarded as the best so far introduced, having regard to the limitations imposed by the necessity for restricting expense and work involved. Methods of official recording could no doubt be further elaborated with a view to entirely eliminating the remotest possibility of error or misrepresenta-

tion, but experience teaches that to complicate the scheme further in this direction would only entail additional outlay and trouble to herd owners and result in decreased membership and a smaller number of cows being tested. The two separate schemes of milk recording now in operation in Scotland should meet in a practical way the needs of the two more or less distinct classes of dairy farmers. From communications on the subject received, it is evident that our paper on 'Milk Recording in Scotland' submitted to the World's Dairy Congress in America in 1923 has attracted the attention of other countries to our Scottish methods.

It is now beyond dispute that regular milk recording carried on for a number of years results in a greatly increased herd average milk yield, out of all proportion to any trouble and expense involved, no matter how the herds may be grouped, whether as a single local milk recording society, as county or district societies, in different countries, or by breeds of cattle; and this result is obtained under widely differing conditions as to climate, soil, situation, &c., and by different methods of recording.

The reasons for this are quite obvious. But it is difficult to understand why the majority of dairy herd owners, not only in Scotland but in every dairying country, remain indifferent. Denmark is generally recognised as probably the most highly developed dairying country, yet even in Denmark, after thirty years of systematic milk recording, only about 25 per cent of the dairy cows are regularly tested; in Scotland the number is about 15 per cent; while in England, America, and other important dairying countries the proportion is considerably less.

It seems perfectly clear, therefore, to impartial observers that if all those herd owners who have not yet adopted systematic milk recording could be brought to do so, the advantage to themselves in the first instance and also to the nation generally would be very great indeed. For instance, Great Britain is still importing dairy produce to the value of over £60,000,000 annually; while the average annual milk yield per cow over the whole country is estimated at under 500 gallons. Universal milk recording would in a comparatively few years increase the home produce by about 40 per cent, and this at relatively very small cost.

But it is equally clear from past experience in this and other countries, the mentality of the average dairy farmer being what it is, that this much to be desired consummation will never be reached under any voluntary system; and we venture to suggest that the time has now come when those in authority in matters relating to the development of the national resources of this country should consider whether obligatory measures of a tentative or experimental character

should not be introduced. For several reasons, Scotland would appear to be a very convenient unit for an experiment of this nature. Scotland is of a convenient size from the dairying point of view; while her new scheme of Private or Unofficial Milk Records, in addition to the Official Authenticated Milk Records compiled during a period of over twenty years, offers a ready avenue of approach in this direction.

This possibility could be explored in two directions. There have been discussions recently as to the advisability of introducing compulsory measures to eliminate the "scrub bull" from breeding herds, and conflicting views have been put forward as to the practicability of such a step, in view of the difficulty of deciding with sufficient definiteness as to the merits of individual animals. But this difficulty should not arise so far as hereditary milking properties in the dairy breeds are concerned. We have in Scotland at the present time sufficient data in official milk records to determine milking pedigree for this purpose.

It is true that evidence of good-milking properties is not all that is required in the ideal dairy herd bull, but breeders generally now agree that this is of paramount importance, and with an obligatory minimum standard of milk record pedigree in operation, breeders could be left free to choose their bulls as to form, symmetry, and other evidences of constitution according to their own individual predilections. Our suggestion along this line is that owners of all herds of not less than a given number of cows—say, twenty cows—of the recognised dairy breeds might be required to use stock bulls with official authenticated milk record pedigrees up to a prescribed minimum standard. This should involve no hardship for any dairy herd owner, and would ultimately lead to great advantage to himself, and prove an immense stimulus to official milk recording in herds generally.

In addition, all owners of dairy herds of not less than the prescribed number of cows who are not members of a local milk recording society for official records might be required to keep records under some simplified scheme, such as the Association's new scheme of Private or Unofficial Milk Records, where the trouble and expense would be reduced to the minimum. Here also no hardship whatever would be imposed on any herd owner, while the advantage that would result in a few years would be greater than can be readily imagined.

Naturally, there would be protests at first from unprogressive milk producers against any gesture of compulsion, but such may be discounted in advance. Statutory obligations are already in force in many directions with great advantage to the community.

ANALYSES FOR MEMBERS DURING 1924.

By Dr J. F. TOCHER, Aberdeen, Analyst to the Society.

THE number of samples submitted for analysis during the year was 270, of which 82 were fertilisers, 59 were feeding-stuffs, 55 were milks, 35 were waters, 9 were soils, and there were 27 examinations for poisons and 3 cattle condiments. The following table (Table I.) shows the numbers and nature of the samples analysed during the past six years :—

TABLE I.

	1924.	1923.	1922.	1921.	1920.	1919
Fertilisers . . .	82	84	86	90	56	44 .
Feeding-stuffs . . .	59	41	29	28	42	41
Waters . . .	35	37	23	22	21	25
Other samples . . .	94	96	76	81	89	45
Total . . .	270	261	214	221	208	155

FERTILISERS.

General.—The fertilisers examined may be classified as follows :—

TABLE II.

Compound fertilisers . . .	24
Potash fertilisers . . .	6
Insoluble phosphatic fertilisers . . .	14
Superphosphates . . .	2
Nitrogenous and other fertilisers . . .	20
Limes and limestones . . .	16
	—
	82

The average composition of the compound fertilisers examined during the year was 5.3 nitrogen, 18.34 soluble phosphate, 3.20 citric soluble phosphate, 3.00 insoluble phosphate, and 4.55 potash.

The following table (Table III.) shows the composition of most of the compound fertilisers examined during the year:—

TABLE III.

	Nitrogen.	Soluble phosphate.	Citric soluble phosphate.	Insoluble phosphate.	Potash.
Special potato manure .	6.55	18.15	1.68	1.74	5.14
Potato manure . . .	4.13	16.34	4.19	2.23	4.44
Special turnip manure .	3.37	21.30	4.39	3.36	2.59
Corn manure	4.81	20.36	0.73	2.55	4.29
Potato manure . . .	6.73	14.66	...	7.47	3.76
Potato manure . . .	6.44	13.37	...	8.00	3.38
Potato manure . . .	6.15	13.96	...	7.23	3.50
Potato manure . . .	8.14	16.56	1.51	5.34	9.88
Potato manure . . .	4.60	18.63	1.23	1.06	5.02
Turnip manure . . .	1.63	...	...	36.76	6.22
Potato manure . . .	6.91	15.05	...	5.48	3.61
Potato manure . . .	7.35	15.51	...	6.28	3.57
Manure	3.04	12.30	...	21.18	4.01
Manure	2.77	15.50	...	17.88	3.18
Special swede manure .	2.61	19.41	2.79	2.66	2.80
Compound manure . .	2.84	18.32	5.98	3.63	2.79
Compound manure . .	1.59	21.50	8.10	5.52	2.40
Potato manure . . .	8.05	15.15	2.58	2.31	5.80
Potato manure . . .	8.40	16.27	2.02	2.52	5.90
Special potato manure .	7.60	17.25	...	3.35	3.06
Manure	5.25	18.08	3.15	3.07	3.59

It will be seen that in these fertilisers the nitrogen ranged from 1.59 to 8.40 per cent. In the case of soluble phosphate the variation was from 12.30 to 21.50 per cent, while insoluble phosphate ranged from about 1.06 to 21.18 per cent. The phosphatic content of slags varied from 21.19 to 46.22 per cent, while the phosphatic content of ground mineral phosphate varied from 56.83 to 72.61 per cent. The fineness of grinding of ground mineral phosphate was in most cases well over 80 through the standard sieve (100 meshes to linear inch), while six samples gave a fineness of grinding of over 80 through the sieve with 120 meshes to the linear inch. Members are reminded that ground mineral phosphate is distinctly alkaline in character, and therefore when mineral phosphate and sulphate of ammonia are mixed together, a slight loss of ammonia takes place. Nitrate of soda is the most suitable nitrogenous manure to mix with ground mineral phosphate. One sample of a sulphate of ammonia was found to contain only 20.3 per cent nitrogen, the usual proportion being 20.8 per cent. The average composition of bone meals was as follows: 4.57 nitrogen, 42.99 total phosphate. The following table (Table IV.) shows the composition of the samples of bone meal:—

TABLE IV.

No.		Nitrogen.	Total phosphate.
1	. . .	4.05	44.06
2	. . .	4.51	40.11
3	. . .	3.11	37.42
4	. . .	5.01	46.11
5	. . .	4.90	45.77
6	. . .	3.89	48.91
7	. . .	3.91	47.19
8	. . .	4.27	44.83
9	. . .	7.49	32.51

Four samples of guano were analysed, with the undernoted results :—

TABLE V.

No.		Nitrogen.	Phosphates.	Potash.
1	. . .	4.09	50.20	0.73
2	. . .	11.11	21.44	2.28
3	. . .	12.05	20.53	2.16
4	. . .	12.27	22.51	2.79

The samples of potash fertilisers had the following composition :—

TABLE VI.

Name of fertiliser.	Potash.	
Potash salts . . .	29.60	
Potash manure . . .	16.05	
Potash salts . . .	29.00	
Potash salts . . .	16.10	
Potassic phosphate fertiliser	4.95	Total phosphate, 50.13 ; fineness, 83.94
Potassic phosphate fertiliser	9.52	Insoluble phosphate, 47.62

A sample of knackery manure contained 3.2 per cent nitrogen, 23.25 insoluble phosphate, and .20 per cent of potash. Owing to the alkaline character of the manure, it was found to be losing ammonia at a fairly rapid rate.

FEEDING-STUFFS.

The feeding-stuffs consisted of the usual seed-cakes and such feeds as pea-meal, bone-and-meat meal, barley, soya bean, oatmeal, and mixed feeding-stuffs. The following table (Table VII.) shows the results of analyses of most of the feeding-stuffs analysed during 1924 :—

TABLE VII.

	OIL.	Albumin-oids.	Soluble carbo-hydrates.	Fibre.	Ash.	Mois-ture.
Dun pea meal	4.10	20.37	50.18	9.67	3.75	11.93
Meal	14.24	10.87	50.59	5.19	8.23	10.88
Ground malt	2.40	13.81	49.65	19.13	4.61	10.40
Ground oats	4.47	9.50	58.49	9.27	2.80	15.47
Dried grains	10.27	22.37	39.37	16.67	2.62	8.70
Barley meal	3.55	10.62	59.58	10.67	3.93	11.65
Home linseed cake . .	8.55	32.56	32.34	10.40	6.42	9.73
Oatmeal 1	7.82	11.56	...	...	...	...
Oatmeal 2	7.84	13.81	...	...	...	...
Bean meal	1.54	22.38	52.74	5.30	3.36	14.68
Barley meal	2.35	9.94	63.08	5.70	2.70	16.23
Linseed cake	14.01	...	...	...	...	...
Feeding-stuff	6.80	14.00	54.11	8.07	5.85	11.17
New Zealand flax seed pods .	9.38	11.31	31.84	31.50	3.97	12.00
do. do.	2.69	3.25	9.14	9.04	1.14	74.74
Compound cake	8.99	18.89	38.58	12.53	7.06	13.95
Bombay cake	4.71	18.32	36.52	22.07	5.70	12.68
Pig meal	3.74	9.81	52.28	10.58	11.48	12.11
White decorticated ground nut cake	8.85	43.37	...	...	...	...
Undecorticated ground nut cake	8.45	26.62	...	...	...	...
White fish meal	3.53	81.44	(Salt 2.34)	...	...	...
Pig meal	3.05	13.88	48.37	12.53	10.27	11.90
do.	3.13	12.31	51.44	12.40	9.00	11.72
do.	2.93	11.33	48.94	13.80	11.94	11.01
Oatmeal dust	8.33	11.38	52.74	12.72	4.16	10.67
Cake	9.09	45.50	21.34	9.00	5.25	9.82
Food stuff	5.56	21.88	46.63	11.14	5.21	8.58
Feed	2.63	11.31	70.13	0.46	2.51	12.96
Fish meal	5.50	63.00	(Nit. 10.08)	...	20.30	13.62
Feeding-stuff	8.61	12.81	53.69	5.08	6.72	13.09
do.	12.75	8.00	61.85	1.61	5.05	10.74
Soya meal	1.37	45.25	29.40	5.00	6.65	12.33
Ground barley	2.47	8.81	65.35	6.06	3.02	14.29
do.	2.53	8.81	66.58	3.73	2.35	16.00
Palm kernel cake	6.96	16.75	...	...	...	...
Ground nut cake	12.47	30.06	...	...	...	...
Decorticated cotton cake .	12.60	32.56	26.75	11.53	6.23	10.33
Compound nuts	8.32	21.94	38.02	9.95	8.64	13.13
Linseed cake	10.89	29.25	34.54	8.25	5.47	11.60
Australian linseed cake .	9.86	28.38	...	...	...	...

The average composition of the condiments analysed was as follows: oil 13.06 per cent, albuminoids 15.48, soluble carbohydrates 45.33, fibre 5.82, ash 8.17, water 11.93. The proportions are not greatly different from the proportions usually found in samples of rice-meal.

The prices charged for condiments are far in excess of the prices that would obtain were these condiments valued for their food constituents. The writer believes that these condiments have no medicinal value, and owing to their high price, he does not recommend their use by members of the Society.

MISCELLANEOUS.

Of the milks analysed, eight were found to be below the prescribed limit of 3 per cent of milk fat, and six were found to be below the prescribed limit of 8.5 per cent solids not fat, while one sample was found to contain as much as 5.5 per cent of butter fat and 10.21 per cent solids not fat. The following table (Table VIII.) shows the composition of most of the samples of milk analysed during the year :—

TABLE VIII.

No.	Fat.	Solids not fat.	No.	Fat.	Solids not fat.
1	5.25	8.28	26	3.50	9.41
2	2.45	8.70	27	3.45	8.94
3	2.60	8.14	28	2.85	8.92
4	2.65	8.15	29	3.70	8.55
5	4.90	8.94	30	3.10	8.67
6	3.05	9.01	31	3.45	8.90
7	3.59	8.70	32	3.65	9.07
8	4.50	8.90	33	3.25	9.37
9	3.80	8.50	34	3.00	8.80
10	4.30	9.35	35	3.15	8.88
11	3.78	9.30	36	3.10	8.57
12	2.20	8.55	37	3.20	8.87
13	5.50	10.21	38	3.55	8.93
14	3.70	8.71	39	3.70	9.39
15	3.40	8.60	40	3.30	8.52
16	3.07	5.83	41	3.05	8.52
17	3.52	7.65	42	3.00	9.10
18	2.95	8.60	43	2.54	8.40
19	4.20	8.97	44	3.70	8.97
20	4.90	8.51	45	3.30	8.76
21	3.80	9.39	46	2.92	9.27
22	4.80	9.36	47	3.50	8.84
23	4.30	8.91	48	3.70	8.60
24	3.40	9.01	49	3.80	9.01
25	3.30	9.06			

The average proportion of butter fat in these samples is 3.54 per cent, while the average proportion of solids not fat is 8.79 per cent.

WATERS.

Of the 35 samples of waters analysed, 27 were found to be of good quality, while 4 were found to be of bad quality. Two samples were found to contain lead, proving that the water was plumbo-solvent, and was thus dangerous to health, while 2 samples were found to contain sewage.

SOILS.

Among the 9 soils analysed, 1 was a sample of a sub-soil, consisting mainly of fine clay or impure silicate of alumina. One sample was found to be a sample of garden soil rich in lime, phosphates, and potash. It was found to be a distinctly acid soil. Two tons per acre of caustic lime were recommended to be applied in the late autumn. The lime requirements of the soils varied from .064 to .12.

EXAMINATIONS FOR POISONS.

Of the 27 examinations for poisons, 4 were found to be cases of lead poisoning, 3 of arsenical poisoning, 1 of phosphorus poisoning, 1 of prussic acid poisoning, while 18 cases were found to be free from poisons of any kind. A sample of flax seed was examined in order to determine whether it could be utilised as a feeding-stuff. The seed was found to contain an exceedingly bitter principle, which rendered the flax pods and seeds quite unsuitable for feeding purposes.

DEPARTMENTAL COMMITTEE ON FERTILISERS
AND FEEDING-STUFFS.

The following are the main recommendations of the Departmental Committee on the Fertilisers and Feeding-Stuffs Act, 1906, which was constituted on 5th July 1923, and which reported on the 27th March 1924 to the Minister of Agriculture (Cmd. 2125. H.M. Stationery Office, 120 George Street, Edinburgh. Price 1s.) :—

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Report.

I. The bases of civil and criminal procedure should
22 be clearly separated, the invoice remaining the founda-
tion of civil claims and the description applied to the
28 goods becoming that of criminal proceedings.

II. The statement in the invoice should be a warranty
22 as at present, and no statement in the invoice should
be held to relieve the seller of his civil liability.

III. The period allowed for sampling should be ex-
22 tended to fourteen days after delivery of the goods or
receipt of the invoice, and the requirement that notice
of sampling be given to the seller should be abolished.

IV. No sample other than those defined on page 24
24 as " formal " or " informal " should be analysed at the
expense of the rates.

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Report.

42 V. The definitions in the Schedules suggested in sub-paragraph (XX.) below should have effect as a warranty.

28 VI. No *criminal* prosecution for the application of a false description should take place except in respect of a sample taken on the premises of the person to be prosecuted, or in the course of transit in a vehicle into which the consignment is loaded by him or his servants, or in the first conveyance of a public carrier into which it is loaded.

35 VII. In the case of samples taken in transit, it should be necessary to provide conclusive proof that they have been taken in accordance with the Act and Regulations.

46 VIII. Failure to give the statutory invoice should be an offence under the Act in respect of which a prosecution may be commenced by any Local Authority administering the Act without the consent of the Government Department concerned. It should not be necessary
27 to take and analyse a sample before prosecuting for this type of offence.

IX. Every parcel of goods to which the criminal provisions of the Act apply should, when prepared for consignment or delivery, be marked in such a way as will
28 indicate to the purchaser the name and address of the to consignor and the description of the goods. It should
30 be permissible for the name and address of the consignor to be applied by means of a mark registered with the Government Department concerned, and for the description to take the form of a code sign, of which the index must be displayed for inspection on the premises of the consignor, and a copy deposited with the Ministry or the Board. Failure to apply the description (or code sign) and the name and address of the consignor (or registered mark) or either of them, before consignment should, save in such cases as those referred to on pages 30 and 36, be an offence under the Act.

27 X. A power of entry into all ports, warehouses, factories, stores, and shops in which fertilisers or feeding-stuffs may be manufactured or stored should be given to authorised inspectors, together with a power to take samples of goods prepared for consignment or delivery, and also a similar power of entry and taking informal samples of any article on the premises when it appears
28 that the analysis of such article may throw light on the question whether fraudulent adulteration has, or has not, taken place on those premises. A power of entry to, and taking samples on, all farms should also be given.

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Report.

XI. Applying a false description to goods prepared
128 for consignment should be an offence under the Act.

XII. The presence of a deleterious substance in a
31 feeding-stuff, or the addition to a feeding-stuff of a
worthless ingredient the presence of which is not dis-
closed, should be an offence under the Act. For this
purpose Schedules to the proposed Act should be pre-
pared to show those substances, with regard to which
there may be reasonable doubt, which are to be re-
garded as "worthless" or "deleterious" for this
purpose.

XIII. Any discrepancy to the prejudice of the pur-
34 chaser between the description attached to a parcel of
goods and the invoice given in respect of it should
constitute an offence under the Act.

XIV. Where an article is described by a name com-
42 prising a name defined in the Schedules, with or without
qualifying words, it should be implied that the article
consists of that substance only.

XV. Prosecutions for the offences set out in paragraphs
46 IX., XI., XII., and XIII. should not be instituted by
any Local Authority, except with the consent of the
Central Government Department.

XVI. No invoice should be required to be given with
36 quantities of goods of not more than half a hundred-
weight sold from bulk, provided the prescribed particu-
lars are clearly stated on a label attached to the bulk
and plainly visible to the purchaser, nor with packeted
goods of not more than half a hundredweight if the
description appears on the package.

XVII. The duty of administering the Act should be
imposed by Statute on all County Councils and County
Borough Councils in England and Wales, and all County
36 Councils and Burgh Councils in Scotland. Power should
to be given to Local Authorities to establish Joint-Com-
39 mittees for the purpose of carrying out the Act, and
also to exercise their powers of entry, sampling, and
prosecution in the area of any other Local Authority
with the consent of that Authority. Concurrent powers
of entry, sampling, and prosecution should be vested in
the Ministry of Agriculture and Fisheries and the Board
of Agriculture for Scotland.

XVIII. Local Authorities should be required to make
public, at least half-yearly, the results of analyses of
21 all formal samples, together with the name and address
of the seller or consignor and the warranty given in each
case.

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XIX. Inspectors under the Act should be senior whole-time officials of the Local Authority. It should
39 be open to the Local Authorities to appoint, in addition to these Inspectors, other Official Samplers for the purpose of taking samples.

XX. The scope of the Act should be defined by
39 Schedules which should indicate, in respect of fer-
to tilisers and feeding-stuffs, (a) the name of each article
41 or class of article to which the Act should apply ; (b) the definition of the substance named ; (c) the particulars to be stated in the invoice for the purpose of the civil warranty ; and (d) the particulars to be stated in the description for the purpose of the criminal provisions of the Act. Provision should be made for amendment of these Schedules, and also those mentioned in paragraph XII., by Regulations made by the Minister and the Board of Agriculture for Scotland, acting jointly.

XXI. The defences set out in Section 2 (2) of the
47 Merchandise Marks Act, 1887, should be provided in place of those afforded by the present Act.

XXII. It should be provided that no civil proceedings,
48 and no criminal proceedings in respect of the applica-
tion of a false description, shall be instituted in the case of any sample unless the results of the analysis of the sample differ from the particulars stated in the invoice or in the description, as the case may be, by more than the amounts prescribed in the "limits of variation."

XXIII. An Advisory Committee, which should subsequently become a statutory Standing Advisory Committee, should be constituted for the purpose of discharging the following functions :—

1. To draw up Schedules for the purpose of prescribing
(a) The fertilisers and feeding-stuffs to which all provisions of the Act should apply, and those to which only the civil provisions should apply ; (b) Definitions of each of the articles or classes of articles to which the Act should apply ; (c) The statements as to the constituents present, and also possibly as to the absence of certain substances in some instances, which should be given by the seller for the information of the farmer in the case of each article ; (d) Those commodities which should be regarded as "worthless" or "deleterious."

2. To recommend the terms in which the valuable constituents should be stated in the invoice (e.g., whether phosphates should be stated as phosphoric acid or as tri-calcium phosphate).

3. To review the limits of variation, and recommend any necessary alterations or additions.

4. To consider the form of code signs and registered marks and the methods of application.

5. To review the existing Regulations, and suggest such amendments and additions as may be thought desirable.

6. To recommend from time to time such alterations to the Schedules and Regulations as may become necessary.

THE CEREAL AND OTHER CROPS OF SCOTLAND FOR 1924, AND THE WEATHER OF SCOTLAND IN 1924.

THE CROPS.

THE following comparison of the cereal and other crops of 1924 with those of the previous year has been prepared by the Secretary of the Society from answers to queries sent to leading agriculturists in different parts of the country.

The queries issued by the Secretary were in the following terms:—

1. What was the quantity, per imperial acre, and quality of grain and straw, as compared with last year, of the following crops? The quantity of each crop to be stated in bushels. What quantity of seed is generally sown per acre?—(1) Wheat, (2) Barley, (3) Oats.
2. Did the harvest begin at the usual time, or did it begin before or after the usual time? and if so, how long?
3. What was the quantity, per imperial acre, and quality of the hay crop, as compared with last year, both as regards ryegrass and clover respectively? The quantity to be stated in tons and cwts.
4. Was the meadow-hay crop more or less productive than last year?
5. What was the yield of the potato crop, per imperial acre, as compared with last year? The quantity to be stated in tons and cwts. Was there any disease? and if so, to what extent, and when did it commence? Were any new varieties planted, and with what result?
6. What was the weight of the turnip crop, per imperial acre, and the quality, as compared with last year? The weight of the turnip crop to be stated in tons and cwts. How did the crop braid? Was more than one sowing required? and why?
7. Were the crops injured by insects? State the kinds of insects. Was the damage greater or less than usual?
8. Were the crops injured by weeds? State the kinds of weeds. Was the damage greater or less than usual?
9. Were the pastures during the season of average growth and quality with last year?
10. How did stock thrive on them?
11. Have cattle and sheep been free from disease?
12. What was the quality of the clip of wool, and was it over or under the average?

From the answers received, the following notes and statistics have been compiled:—

EDINBURGH DISTRICT.

MID-LOTHIAN. *Wheat*—48 bushels per acre, but yields will be unusually varied over the county; straw very heavy, in many cases 2 tons per acre; sample of grain, where crop badly lodged, will be inferior and much below average; 4 bushels per acre sown. *Barley*—48 bushels per acre; some heavy crops badly lodged will be under average in yield and of poor quality; the general sample is decidedly under average owing to lack of sunshine, and many lots of soft poor quality have been put on the market; straw soft but bulky, and quite an average; 3 to 3½ bushels sown. *Oats*—52 bushels per acre, but crop varied very much, and some yields will be higher, while some badly-laid crops will turn out very disappointing; straw over the average, but of poor quality in many cases; sample of oats fair; 5 to 6 bushels per acre sown. A late harvest, with much rain, has had an adverse effect on all the cereal crops. *Harvest*—Later than usual, possibly 14 days. *Hay*—Nearly 3 tons per acre, a bulky crop; under average in quality; very little second crop cut, probably owing to late season. *Meadow-hay*—Not much grown. *Potatoes*—9 tons per acre; rather heavier crop than usual, but a good deal of disease among Great Scots, British Queens, &c., and they have not kept well in pits; acreage under “immune” varieties about same as last year. *Turnips*—18 tons per acre; good quality, but rather under average. *Insects*—No evidence of any damage. *Weeds*—Not much injury done, but weeds were very prevalent, and not easily killed; owing to abnormally wet summer the horse-grubbers or hoes were not used to same advantage as usual, and in many cases where land was stiff and wet it was hardly possible to do much good with them. *Pastures*—Over average in growth, but quality was decidedly under the average; not nearly so much feeding value. *Live Stock*—Both cattle and sheep, especially the former, did not seem to put on flesh—in fact, they came off the pastures very little better than when they were put on in the spring. Cattle and sheep free from disease on the whole. *Clip of wool*—Good quality, and much better prices realised; quite an average clip.

WEST LOTHIAN. *Wheat*—Very poor yield—say, 50 bushels; straw good; quality of grain moderate; seed sown, 4 bushels. *Barley*—44 to 46 bushels; straw short; seed sown, 4 to 5 bushels. *Oats*—46 to 48 bushels; straw short; seed sown, 6 to 7 bushels. *Harvest* late, and owing to wet weather was very protracted. *Hay*—40 cwt. per acre, and not as good quality as last year. *Meadow-hay*—Very little grown. *Potatoes*—Earlies, 4 to 5 tons per acre; lates, 7 to 10 tons per acre; a little disease. *Turnips*—18 to 23 tons; slow to braid, and a very moderate crop. *Insects*—No damage. *Weeds*—Wet weather caused a lot of dirt. *Pastures*—Good. *Live Stock* did well. Cattle and sheep free from disease. *Clip of wool*—Good.

EAST LOTHIAN (Upper District). *Wheat*—40 bushels per acre; considerably below an average in grain; weight of straw about

normal—40 cwt. ; quality of grain was below an average, on account of the cold wet season. *Barley*—44 bushels ; this crop also did not thrash up to the average of the last few years, and the quality of grain was much below Lothian quality ; the quantity of straw was above an average ; quality not good, on account of being so much laid. *Oats* also under average—52 bushels ; straw above an average ; quality fair, but varied very much, this crop being laid also on some farms ; quality of straw not up to usual. *Harvest* was ten days later in starting, and was much prolonged, on account of the laid crops and unsettled weather. *Hay*—45 cwt. per acre ; good bulk and quality ; not so good as the previous years. *Meadow-hay*—None grown. *Potatoes*—Yield above the previous year, with an average in most varieties of 8½ tons ; little disease in some varieties, in others ½ or even in some exceptional cases ½ diseased ; where “Golden Wonders” are still grown, about 5½ tons were lifted. *Turnips*—Much above an average—25 tons per acre ; braided well ; nothing to hinder growth well into the autumn. *Insects*—No damage. *Weeds*—Nothing unusual. *Pastures*—Good all summer ; season favourable for pastures ; nothing to complain of in quality. *Live Stock* did well—both sheep and cattle. Cattle and sheep free from disease. *Clip of wool*—Clip a full average.

EAST LOTHIAN (Lower District). *Wheat*—36 to 44 bushels ; crop a fair one, not yielding as heavy as the bulk of straw indicated ; 3 to 4 bushels sown. *Barley*—A very heavy bulky crop, yielding 48 to 60 bushels ; heavy bulk of straw ; seed sown, 3 bushels. *Oats*—A bulky crop ; 48 to 72½ bushels ; seed sown, 4 bushels potato oats, up to 5½ coarse varieties. *Harvest*—Little cutting before 28th August, fortnight later than average ; crops so laid and twisted made cutting by binders a very slow operation ; many fields had to be cut by the hook. *Hay*—A heavy crop ; 2 to 3 tons. *Potatoes*—A poor crop, especially upon heavy soils ; about 70 per cent of a full crop, and from 1 ton to 2 tons per acre of diseased tubers. *Turnips*—A good average crop. *Insects*—No serious damage. *Weeds*—Charlock again much in evidence in cornfields ; more requires to be done to eradicate it. *Pastures* were growthy and luxurious, but not the most favourable for stock doing well on. *Live Stock*—Cattle and sheep free from disease ; no foot-and-mouth disease in the district. *Clip of wool*—Good ; average.

BORDER DISTRICT.

BERWICKSHIRE (Merse). *Wheat*—Winter-sown wheat an excellent crop, with a large yield of straw and 35 to 50 bushels of grain ; little spring wheat sown ; seed, 2½ to 4 bushels. *Barley*—This crop looked well at midsummer, but owing to the wet season was disappointing at harvest time, with much of the crop laid and a poor sample of grain ; yield, 30 to 50 bushels ; seed sown, 2 to 3½ bushels. *Oats*—A very disappointing crop on some farms, owing to the attacks of leather-jackets ; the braird was excellent until these pests began their ravages ; on light soils the crops were excellent, and a good yield of both grain and straw was obtained ; grain, 24 to 60 bushels ; seed, 4 to 6 bushels. *Harvest* did not begin until some three weeks

later than last year; lasted well on into November on the high ground. *Hay* was a very fair crop generally, but was "got" in poor condition owing to the weather. *Meadow-hay*—A very heavy crop, which was, however, difficult to save. *Potatoes*—A smaller area of potatoes was sown, and these varied from 1 ton per acre on the heavy soils to a good average crop on the lighter soils; in spite of the heavy rains, disease was not specially noticeable. *Turnips*—Early-sown turnips were a huge crop, up to 50 tons per acre; on the late wet land, however, they were more or less drowned out, and never came to more than half a crop; the crop braided very well, and second sowings were unnecessary. *Insects*—The oat crop was in many places very badly damaged by grub (snails and leather-jackets). *Weeds*—Thistles were much in evidence. *Pastures*—An abundance of grass on all pastures, but sheep and cattle did not put on flesh as they should have done. *Live Stock*—Cattle and sheep free from disease. *Clip of wool*—Under the average.

BERWICKSHIRE (Lammermoor). *Wheat*—Almost none grown. *Barley*—A good crop, but rather poor quality, due to being laid early in the season by excessive rains; straw very bulky, but of poor quality; yield of grain around 36 bushels; 3 to 4 bushels sown. *Oats*—Well above an average crop for the district, growth all season being very strong; crop badly laid and difficult to handle; quality of grain only fair; much spoiled, and mostly very poor weight per bushel; yield, say, 40 to 44 bushels; straw very abundant, but of variable quality. *Harvest*—About 10 days later than last year; a very slow and expensive harvest owing to wet weather and twisted condition of the crops. *Hay*—About 2 tons; good crop, and secured in fairly good condition. *Meadow-hay*—Also a good crop, and secured in better order than last year. *Potatoes*—Poor crop, due to excessive moisture; a considerable amount of disease showed from August onwards; yield not more than 5 tons saleable potatoes per acre; no new varieties of note planted. *Turnips*—Except on wet stiff soil a full average crop; on badly-drained and very stiff soil a poor crop, due to water-logged state of the land; yield 18 to 20 tons. *Insects*—Very little damage done by insects; some wireworm in oats; damage not nearly so great as last year. *Weeds*—Charlock rather bad in corn crops; annual weeds and "rack" more troublesome than last year in the turnip crop, due to difficulty in getting suitable weather for hoeing operations. *Pastures*—Full average growth, but quality deficient compared with last year. *Live Stock*—Stock did not put on flesh so quickly as usual. Cattle free from disease; sheep fairly free from disease, though "scour" in lambs and "scrapie" in older sheep caused considerable trouble. *Clip of wool*—Average clip of good quality.

ROXBURGHSHIRE. *Wheat*—Almost none grown. *Barley*—An abundant crop as regards straw, but grain short on all the high-lying land; on the good low country land grain would be something similar to last year, say, 30 bushels, with 18 cwt. straw. *Oats*—A very heavy crop, very much laid, much of it early in the year; grain inferior; very difficult to harvest; the machinery would not act, and, owing to want of labour and wet weather, it was a tedious business, but most of the crop was got in fair condition; straw very

inferior; average yield might be 36 bushels and straw 20 cwt. *Harvest* began in the beginning of September, and lasted seven or eight weeks, and in some cases longer. *Rye-grass Hay*—A good crop, similar to last year, but much of it deteriorated from weather conditions; say, 2 tons. *Meadow-hay*—Quite as good a crop as last year, but a great deal of it destroyed, and much of it never got at all. *Potatoes*—A good crop, say, 8 tons per acre; not much disease; usual main crop varieties planted; no report of new varieties. *Turnips*—On good land a very fine crop, say, from 20 to 25 tons per acre; on cold clay land, where wet, a poor crop; the land was so wet below in spring it could not be worked satisfactorily. *Insects*—No damage from insects, but a good deal of dry rot and finger-and-toe appeared in many places; land wanting lime. *Weeds*—The land in Roxburghshire, as a whole, is fairly clean, and not much damage was caused, except in fields that are subject to runches. *Pastures*—Abundant grass year; in many places not eaten enough; would require more cattle. *Live Stock* did not do so well as usual; cold wet spring; the ewes lost condition, and the milk went off them; a good many lambs died, and there was a great number of secondary lambs. Cattle and sheep: no foot-and-mouth disease; foot-rot very troublesome; scrapie still showing in many flocks more or less; general softness amongst sheep, resulting in more than a normal death-rate; lamb sickness prevalent on many of the hill farms. *Clip of wool*—A good clip; not quite so heavy as last year, but would be average.

SELKIRKSHIRE. *Wheat*—None grown. *Barley*—A good crop; 36 bushels per acre. *Oats*—A very good crop, due to the suitability of the season; yield from 40 to 48 bushels, and in special cases 64 bushels. *Harvest*—The harvest was, owing to unfavourable weather, a protracted one, and cutting a costly business, but wonderfully little damage was done to the grain; straw suffered for feeding purposes, for which it is a great asset in this county. *Hay*—2½ tons; quality only medium; generally not so good as last year. *Meadow-hay*—2 tons per acre, but very little was got satisfactorily. *Hill-hay* was practically a failure—even worse than last year. *Potatoes*—5 to 6 tons per acre; some disease; it, however, did not start early, which restricted the damage; Kerr's Pink was grown more extensively than formerly, and did very well. *Turnips*—12 to 16 tons per acre; in every way inferior to last year; owing to the wet seed-time, 10 per cent to 20 per cent in some cases were failures; practically no resowing. *Insects*—None. *Weeds*—Very little damage. *Pastures* of average growth and quality. *Live Stock* thrived well. Cattle and sheep free from disease. *Clip of wool*—Good quality, and over an average.

PEEBLES SHIRE. *Wheat*—Very little grown, if any. *Barley*—40 to 45 bushels, and 17 to 20 cwt. straw; seed, 4 bushels per acre. *Oats*—40 to 50 bushels; 17 to 25 cwt. straw; seed, 5 bushels per acre. *Harvest* began a week later; standing oats were well secured, but a large quantity was badly laid, and cost more than it was worth to get it cut and secured. *Hay*—35 to 45 cwt. per acre; early-cut hay was got in fair order, but later cut got badly damaged by wet weather. *Meadow-hay*—30 to 45 cwt. per acre; also secured in

middling order. *Potatoes*—6 to 8 tons per acre ; quality good, but did not keep too well in pits. *Turnips*—18 to 25 tons per acre ; quality good ; seed braided very evenly, and no second sowing. *Insects*—Not so much damage as usual. *Weeds*—Very little damage. *Pastures* were quite as good as last year. *Live Stock* did fairly well, but owing to grass being always wet, it was soft, otherwise they would have done better. Cattle and sheep free from disease. *Clip of wool*—Much the same as last year, and quality good.

DUMFRIES DISTRICT.

DUMFRIESSHIRE (Annandale). *Wheat*—Little or none grown. *Barley*—Very little of this cereal is now grown ; the yield of grain and straw would be about the same as in 1923—straw, 22 cwt. per acre, grain 28 bushels per acre. *Oats*—Sowing began about 14th March, and was general by the 24th. The braird came away strongly, but the ravages of grub were soon evident, with the result that many fields had to be resown. The yield of grain, and especially straw, was above that of 1923. Grain, 33 bushels per acre : straw, 30 cwt. per acre ; quantity of seed sown about 5 bushels per acre. *Harvest* began about the 5th September, being about a fortnight later than usual, and it proved to be one of the worst and costliest for many years. The scythe in many cases had to be resorted to. *Hay*—Rye-grass hay was about the same as last year's average—viz., 30 cwt. per acre. The growth of clover was not quite so strong as last year, nor was the quality so good. Owing to the very wet weather during haymaking, much of the crop was damaged. *Meadow-hay*—Meadows were about the same as last year ; average weight about 30 cwt. per acre. Very little of this crop was got without being somewhat damaged. *Potatoes* were, on the whole, rather a poor crop, owing to the wet sunless season—average yield about 5 tons per acre. Disease was slight. No new varieties were tried. *Turnips* were very variable. On heavy soil the crop was very poor, but on dry loamy soil it was good. The yield was under last year's—average crop 18 tons per acre. The plants braided well, and little resowing was required. *Insects*—Grub did extensive damage to oat crop. Wireworm and turnip-fly were not so prevalent as usual. *Weeds*—Owing to the very wet season, weeds were difficult to keep under, and much damage was done, especially to turnips. *Pastures*—Growth on dry land was good and above that of last year, but on stiff heavy soil the growth was disappointing. The quality would be about the same as in 1923. *Live Stock* on pasture did not thrive so well—again owing to the wet cold summer—and were slow to get into condition for the market. Cattle and sheep : disease among farm stock during the year was less than in 1923. *Clip of wool*—About an average in quantity and quality.

DUMFRIESSHIRE (Nithsdale). *Wheat*—None grown. *Barley*—None grown. *Oats*—A good crop ; laid badly on good land ; 33 bushels per acre ; 5 bushels seed sown. *Harvest* started about same date as in 1923—about two weeks after usual time. *Hay*—Quality good ; about 1½ tons per acre. *Meadow-hay*—Rather less productive, but quality very much better than last year. *Potatoes*—About 2 tons

per acre above last year ; 6 tons 8 cwt. per acre ; very little disease. *Turnips*—About 20 tons per acre ; early sowing, from 20th April till 8th May, braided nicely ; later sowings of swedes did middling ; yellows did well. *Insects*—None. *Weeds*—About usual. *Pastures*—A grand year for grass till end of August ; back-end too cold. *Live Stock* thrived very well. Cattle and sheep free from disease. *Clip of wool*—Quality average ; about $\frac{3}{4}$ lb. per sheep under usual weights ; this was caused by cold barren weather in March, April, and May.

DUMFRIESSHIRE (Eskdale). *Wheat*—None grown. *Barley*—None grown. *Oats* were not well harvested owing to rain almost every day ; thrashing about 34 bushels per acre ; straw not good fodder ; seed sown, 6 bushels per acre drilled, 7 bushels per acre broadcast. *Harvest* began about usual time, but dragged on for a long time, as it was almost impossible to get crop dry to cut. *Rye-grass hay* not such a heavy crop, but was secured in fairly good condition. *Meadow-hay* was very heavy crop, but quality not good, as no sun to dry it. Much the same quantity as last year, but more of it was secured this time, although not in good condition. *Potatoes*—Heavier than last year ; about 8 tons per acre ; some places bad with disease and other places very free ; depended largely on ground, as low-lying fields were far too wet ; no new varieties planted. *Turnips* much heavier ; most places had a very good crop ; braided well, and came very nicely to hoe ; no second sowings required excepting in a few cases. *Insects*—None ; too wet. *Weeds*—Crops were injured in many cases, as it was too wet to get weeds killed ; charlock greatest pest. *Pastures* were not up to average ; too wet and cold for either growth or quality. *Live Stock* thrived wonderfully well considering the weather. Cattle and sheep free from disease. *Clip of wool*—Good quality ; over the average.

KIRKCUDBRIGHTSHIRE. *Wheat*—None grown. *Barley*—None grown. *Oats*—An abundant crop, both of straw and grain ; much wasted by adverse weather conditions immediately preceding and during harvest ; quality on the whole fair, and much better than last year ; yield 50 bushels per acre ; straw 30 cwt. per acre. *Harvest* a fortnight later than usual, and was very protracted. *Hay*—Rotation hay a heavy crop, both of grasses and clover ; about 35 cwt. per acre. *Meadow-hay* a heavy crop, equal to last year, and generally saved in fair condition. *Potatoes*—Early varieties a good crop ; probably 2 tons heavier than last year ; disease showed early in July, and there was considerable waste from this cause ; the average yield would be 8 tons, but there were some quite remarkable yields of first earlies up to 12 tons per acre ; late sorts also raised well, but nearly all had some disease ; the average would not exceed last year. *Turnips*—A good sound crop ; braided well, and little after-trouble ; 20 tons per acre. *Insects*—Less damage than usual. *Weeds* gave great trouble, owing to rainy conditions and difficulties of tillage ; chickweed, redshank, and spurry abundant. *Pastures* very abundant, and long-continued. *Live Stock* healthy. Cattle and sheep free from disease.

WIGTOWNSHIRE. *Wheat*—Very little grown. *Barley*—Very little grown. *Oats*—Lea oats were a fairly bulky crop, but badly laid

and twisted; oats after green crop not so badly laid; the crop threshed badly, from 28 to 40 bushels per acre; the bulk of straw was big, but owing to the continued wet weather it was poor washed-out stuff; the quality of the grain was mostly inferior, soft, and not well filled; seeding, 6 bushels sown by hand, and 4 to 4½ by drills. *Harvest* began in the first week of September on early farms, was quite general by the middle of the month, and ran on in many instances until the third week of October. *Hay*—Rye-grass and clover hay was a heavy crop; from 40 to 50 cwt. per acre. *Meadow-hay*—A good crop, but very difficult to save. *Potatoes*—Yield was irregular; where boxed the crop was generally quite good, but moderate where not sprouted; yield would run from 6 to 10 tons per acre; a little disease in some cases. *Turnips*—On wet tilly land and clay soil the crop was very poor; damage was caused by grub, necessitating resowing; the weight per acre might be anywhere from 8 to 18 tons. *Insects*—Crops injured in some instances by grub. *Weeds*—None. *Pastures* were more than average growth; quality not so good. *Live Stock* thrived on them. Cattle and sheep free from disease. *Clip of wool*—Quite fair; rather over the average.

GLASGOW DISTRICT.

AYRSHIRE. *Wheat*—45 bushels; 59 lb. per bushel. Straw 32 cwt.; quality of both grain and straw below average; acreage under wheat was only half of the previous year; seed, 3 to 3½ bushels per acre. *Barley*—36 bushels; 54 lb. per bushel. Straw 24 cwt.; both grain and straw under average quality; acreage, less than half of the previous year; seed, 3 to 4 bushels per acre. *Oats*—47 bushels per acre, weighing 39 lb. per bushel. Straw 29 cwt.; quality of both, but especially the straw, inferior; acreage also reduced about 5 per cent; seed, 5½ to 7 bushels per acre. *Harvest* began about the beginning of September, but was protracted on account of the weather and the condition of the crop, much of it being badly lodged. While the grain and straw were not of the average quality, there was not much of either completely wasted. Samples of grain suitable for seed are not plentiful locally. *Hay*—1 ton 17 cwt. per acre. Very little was secured without having suffered to a greater or less extent from exposure. The crop of seed was above average, but the quality was not up to the usual standard. *Meadow-hay*—1 ton 15 cwt. per acre, secured in only moderate condition. *Potatoes*—From 7 to 8 tons per acre. There was some disease, but not to the same extent as last year. Seed in the majority of cases has kept fairly well. No new varieties were planted. *Turnips*—About 20 tons per acre; quality good, the only exception being on stiff land requiring draining. The seed germinated well, and no resowing was necessary. *Insects*—Little damage caused by insect pests. *Weeds*—Not more damage than usual, but, owing to the continued wet, weeds were difficult to kill; more than the usual hoeing was necessary to keep them in check. *Pastures*—The weather kept cold in early summer, and grass was scarce during the early part of the season. Latterly an improvement took place, but the feeding properties did not seem to be equal to an average season. *Live Stock*—Only moderately well on account of the late spring

and the absence of sunshine during the whole season. Cattle and sheep were free from disease, excepting for a few outbreaks of foot-and-mouth disease in the early part of the season. Several herds of dairy stock were brought through the disease successfully, but the long isolation of the district interfered with the movement of stock for a lengthened period. *Clip of wool*—About an average clip; $4\frac{1}{2}$ to 5 lb. from hill stock and 6 to 8 lb. from feeding sheep on low ground.

BUTE. *Wheat*—None grown. *Barley*—None grown. *Oats*—A good crop generally; 2 or 3 fields a failure on account of wireworm, but they filled up wonderfully before the end of the season; not thrashing well; 25 to 36 bushels per acre; 6 bushels per acre sown. *Harvest*—Began cutting on 2nd September, a little earlier than last year; the harvest was very prolonged this year again, but finished a little earlier—on 21st October; had a short spell of good weather at the end, which made a better finish up than last year. *Hay*—Better crop than last year, but still a scarcity of clover; quality fairly good; $1\frac{1}{2}$ tons to the acre; had not very good weather for the hay harvest. *Meadow-hay*—Very little grown; crop no better than last year, and quality very poor. *Potatoes*—"Epicures," early variety, began digging 26th June; crop much the same as last year; average about 5 tons; second earlies were a better crop than last year, as were also the late crop; about $7\frac{1}{2}$ tons; "Field Marshal" did well this year as a late potato; very little disease. *Turnips*—Crop very irregular; on early dry land and where early sown the crop was an average one, but on cold wet land the crop was in many cases a failure; 10 to 20 tons per acre; braided well; more resowing than usual on account of fly and grub. *Insects*—Crops not damaged to any great extent. *Weeds*, on account of the continuous wet weather, could not be kept down among turnips, and injured the crop in many cases; no injury to any other crop. *Pastures*—Very poor all summer, greatly under average for quality; failed early in the autumn; the want of sunshine was greatly against the pastures. *Live Stock* did not do well, and came off the pastures lean. Cattle and sheep healthy. *Clip of wool* about an average, and quality good.

ARRAN. *Wheat*—None grown. *Barley*—None grown. *Oats*—Fairly good crop, but late, and grain very light, about 35 lb. per bushel; the return per acre varied from 20 to 25 bushels; seed sown from 5 to 6 bushels. *Harvest*—About same time as last year. *Hay*—About 25 cwt., and the quality was fairly good; a fair amount of grass seed was saved, farmers finding this a remunerative crop when quality good, as it was last year. *Meadow-hay*—Yield about the same as last year; some very inferior quality, as, owing to wet season, with some rain every day, great difficulty was experienced in saving crops. *Potatoes* better than last year; from 4 to 8 tons per acre; very little disease; many farmers specialise in growing for the seed market, as potatoes from the island do exceptionally well when taken to the mainland; some new varieties planted, but still in experimental stage. *Turnips* better than last year; 8 to 12 tons per acre; crop braided and came away well, and no second sowing required. *Insects*—The "leather-jacket" grub was very destructive on swedes, and cleared many acres; most unusual to find these on arable land. *Weeds*—Crops not injured to any extent. *Pas-*

tures—Very good pasture ; better than last year. *Live Stock* thrive exceptionally well. Cattle and sheep free from disease. *Clip of wool* good, and up to a good average ; mostly all Black-faced wool.

LANARKSHIRE (Upper Ward). *Wheat*—None grown. *Barley*—Only small quantities grown. *Oats*—40 to 50 bushels ; both more grain and straw than last year, and better quality ; 4 to 6 bushels sown. *Harvest* started generally about middle of September ; some earlier kinds were cut about first week in September ; the later districts got the best weather ; a good many fields were badly "wormed" in the spring, some being so bad that they had to be sown with rape. *Hay*—40 to 50 cwt. ; better quality than last year. *Meadow-hay*—Much the same as last year, but better got ; weather much better. *Potatoes*—8 to 12 tons ; the best crop for years, both as regards quantity and quality ; very little disease ; no new varieties. *Turnips*—30 to 40 tons ; some special crops even heavier ; good quality ; crop braided well ; no resowing. *Insects*—Damage much the same as usual. *Weeds*—Crops not much injured by weeds ; weather much better for killing weeds than last year ; damage less than usual. *Pastures* better than last year, lasting well into autumn. *Live Stock* thrive well. Cattle and sheep : continued outbreaks of foot-and-mouth disease in January and February ; some scour in young lambs towards end of lambing. *Clip of wool*—Average.

LANARKSHIRE (Middle Ward). *Wheat*—35 to 40 bushels ; straw, 30 to 40 cwt. per acre ; seed sown, 4 bushels ; quality of grain and straw rather inferior, especially where early harvested. *Barley*—None grown. *Oats*—35 to 50 bushels ; straw, 30 to 40 cwt. per acre ; seed sown, 6 to 7 bushels per acre. *Harvest* was very protracted from beginning to end, and grain and straw were much damaged from sprouting, owing to continued wet weather. *Hay*—A good crop ; 30 to 40 cwt. per acre. *Timothy-hay* a heavy crop ; 35 to 55 cwt. per acre. *Potatoes* turned out a small crop, with a good deal of disease ; some damage by wireworm, but high prices were realised ; weight of crop, 4 to 9 tons per acre. *Turnips* were a fair crop ; from 10 to 22 tons per acre ; no disease. *Insects*—There was a great deal of grub and wireworm in oats during the season. *Weeds*—The wet weather encouraged the growth of weeds, and much difficulty was experienced in cleaning the drilled green crop. *Pastures* were plentiful. *Live Stock*—No foot-and-mouth disease, and generally cattle were healthy. *Clip of wool*—Very few sheep in this Ward.

LANARKSHIRE (Lower Ward). *Wheat*—40 to 45 bushels ; quality better than last year ; straw, average ; seed sown, 3½ bushels per acre. *Barley*—None grown. *Oats*—Earlier harvested oats good, others fair ; straw above average ; yield per acre less than last year. *Harvest*—Same time as last year—viz., in first week of September. *Hay*—Rye-grass and clover mixture about 2 tons per acre ; Timothy the same. *Meadow-hay*—None grown. *Potatoes*—3 to 4 tons better than last year, and an average crop for the district ; some disease in second earlies, none in main crop ; disease started in August ; no new varieties planted. *Turnips*—25 to 30 tons ;

quality better than last year; the crop braided well; only one sowing required. *Insects*—No damage done. *Weeds*—None. *Pastures*—Average growth and quality until September, when, owing to wet season, pastures got bare. *Live Stock* did well until September. Cattle and sheep were free from disease after the spring, when foot-and-mouth disease stopped. *Clip of Wool*—Average.

RENFREWSHIRE. *Wheat*—35 to 40 bushels; straw, 30 cwt. per acre; seed, 4 bushels per acre; quality of both grain and straw not up to usual standard; owing to drawn-out harvest much grain lost in handling. *Barley*—Very little now grown in this county, with result that the fiars price for same is struck as from that grown in neighbouring county. *Oats*—Average quantity, about 40 bushels; straw, 25 cwt. per acre; seed, 5 to 5½ bushels per acre; quality of both grain and straw much below usual standard. *Harvest*, as a rule, commenced about the same time as last year, lasted longer, and from start to finish was the most trying, troublesome, expensive, and disappointing experienced for years. *Hay, rye-grass, and clover* up to the usual average of about 45 cwt.; through want of sun and much broken weather the quality (generally) was not up to usual. *Meadow-hay*—Quantity much as usual, but, owing to broken weather, much damage and loss. *Potatoes* fully as good as last year; average about 6 tons per acre; no disease to speak of, and no new varieties calling for attention. *Turnips*—Average crop, 18 tons; quality quite good; braided very slowly; some few cases of resowing. *Insects*—No injury. *Weeds*—The wet sunless season made it impossible to keep land as clean as would have been the case under ordinary circumstances. *Pastures* were quite good, but quality not so good on account of want of sunshine. *Live Stock* did not thrive so well as usual, as was to be expected from such a sunless wet season. Cattle and sheep both free from disease. *Clip of wool* quite up to usual, both as regards quality and weight.

ARGYLLSHIRE (Lochgilphead). *Wheat*—None grown. *Barley*—None grown. *Oats*—Better than last year; grain very good; about 5 bolls per acre; straw about 18 cwt.; seed sown, 6 bushels per acre. *Harvest*—Later than usual, but a few days earlier than last year; began 3rd September, general about the 10th. *Ryegrass hay*—Rather better than last year; about 25 cwt. per acre; quality good. *Meadow-hay*—Rather better than last year, also better secured. *Potatoes*—Better than last year; probably about 5 tons per acre; disease pretty bad in some varieties; began early; no new varieties. *Turnips* not so good as last year; crop braided all right, but attacked by grub, and had to be resown in some cases; too much rain; yield about 12 tons. *Insects*—Oats and turnips both damaged a little by grub; more than usual in turnips. *Weeds* very prevalent owing to wet season; impossible to keep turnips clean; weeds—redshank, spurry, and chickweed. *Pastures* luxuriant, but very soft. *Live Stock* did only fair; pasture too soft, and wanted sunshine. Cattle and sheep free from disease. *Clip of wool*—Quality of clip good, and rather above the average.

ARGYLLSHIRE (Kintyre). *Wheat*—None grown. *Barley*—No better than last year; poor crop, except on the best of land; about

40 bushels, but much of it less; 4 bushels seed sown. *Oats*—Much about the same as last year; less straw, but thrashing rather better; grub not so bad as last year, but one or two fields very bad; some saved by using Paris Green. *Harvest* started about the same time as last year, but sooner finished; none spoiled. *Hay*—Quite as good as last year, and fully better got; about two tons per acre. *Meadow-hay*—About the same as last year, but much better got; none spoiled, although the weather was not good. *Potatoes*—Much better than last year, but not a big crop; from 5 to 8 tons; not much disease; no new kinds planted. *Turnips*—No better than last year; on clay ground worth nothing; braided quite well, but destroyed by grub; a lot sowed twice and some thrice, and no results after all. *Insects*—Grub very much worse on the turnip crop than in any former year. *Weeds*—Crops were not much injured, but, owing to the wet season, land was not so well cleaned as usual. *Pastures* were better than last year on light land, but no better on clay land; stood out well in the autumn. *Live Stock* thrived quite well. Cattle and sheep free from disease. *Clip of wool*—Quality not so good as last year, and quantity under the average.

ARGYLLSHIRE (Islands of Islay, Jura, and Colonsay). *Wheat*—None grown. *Barley*—None grown. *Oats* about 35 or 36 bushels per acre; from 30 to 38 lb. per bushel; 5 bushels sown per acre. *Harvest* began somewhere about the usual time, and, although protracted, finished well. *Hay*—Better than last year; about 30 cwt. per acre; got in good condition. *Meadow-hay*—Similar to last year, but the floods in end of September washed away quantities, and soaked the remainder. *Potatoes*—An average crop; much better than last year, and quality good; about 3 to 5 tons per acre; no new varieties planted in any quantity; "Kerr's Pink," "Arran Chief," and "British Queen" are favourites. *Turnips*—About 6 to 7 tons per acre; much better than last year; crop braided well—only one sowing required; slow of coming to maturity. *Insects*—None. *Weeds*—Usual; chickweed very bad amongst potatoes, especially early varieties, with short weak haulms. *Pastures*—Average growth and quality with last year, but failed in early August; rain and wind-swept. *Live Stock* did well, and carried on outside until November; in fact, were it not that farmyard manure was required, cattle could easily have been outwintered in greater numbers. Cattle and sheep: usual braxy in hogs, and fluke very bad in ewes; heavy death-rate looked for in spring at lambing. *Clip of wool*—Quite up to the average; on a Blackface stock average nearly 5 lb. per head.

STIRLING DISTRICT.

DUMBARTONSHIRE (Upper). *Wheat*—None grown. *Barley*—None grown. *Oats*—About 20 bushels per acre; straw deficient owing to cold wet summer; a lot of lea oats suffered badly from grub, in some cases causing resowing. *Harvest* began about two weeks later than average, and was very troublesome, owing to wet weather. *Hay*—A light crop, deficient in clover; was got in fair order; about 25 cwt. per acre. *Meadow-hay*—A good crop, but wasted by rain; like last year, a lot was never cut. *Potatoes*—A poor crop, even less

than last year; about $3\frac{1}{2}$ tons per acre; there was a good deal of disease in most kinds except "Golden Wonders"; disease began about the end of August. *Turnips*—A light crop; about 12 tons per acre; crop braided well, and there was no resowing. *Insects*—A great deal of damage was done to lea oats by leather-jackets. *Weeds*—More damage than usual; yarr was bad in oats after green crop, and redshank in turnips. *Pastures* were late and not of average feeding value, but grass was good all season on the hills. *Live Stock* thrived well. Cattle and sheep free from disease. *Clip of wool* was under the average, both in quantity and quality.

DUMBARTONSHIRE (Lower). *Wheat*—About 34 bushels per acre; quality of grain and straw about the same as last year; seed sown, $3\frac{1}{2}$ to 4 bushels per acre. *Barley*—Little or none grown. *Oats*—Quite a bulky crop where not spoiled by grub; about 38 bushels on an average; quality only fair, owing to excessive rainfall; seed sown from 5 to $6\frac{1}{2}$ bushels—with drill a bushel less. *Harvest*—About the same time as last year, which was about two weeks later than usual. *Hay*—An average crop; about 34 cwt per acre; more or less damaged by wet weather. *Meadow-hay*—Something similar to last year, but weather so wet that very little of it was secured in good condition; a lot of it was never cut. *Potatoes*—Not so heavy as last year; from 3 to 7 tons according to variety; the late main crop varieties, such as "Golden Wonder," in a great many cases did not mature. *Turnips*—About 17 tons; generally a very small crop on stiff land; more finger-and-toe than usual. *Insects*—More damage done to the oat crop by grub in this district last year than in any year one can remember. *Weeds*—Some damage done by wild mustard to the oat crop; turnip and potato crop very difficult to keep clean, owing to wet weather; spurry, chickweed, and redshank very prevalent. *Pastures* of fair average growth considering the wet season. *Live Stock* did not thrive extra well. Cattle and sheep free from disease. *Clip of wool*—Average.

STIRLINGSHIRE (Western District). *Wheat*—None grown. *Barley*—None grown. *Oats*—36 to 40 bushels; straw about 20 cwt.; seed 5 to 6 bushels per acre; there was a good deal of worming, due to the cold wet season and want of sunshine; the weather for early harvesting was very bad, there being hardly one whole dry day during the first three or four weeks; the later crop got better weather; a good deal of damage to grain and straw. *Harvest*—Same time as last year, about 10th September. *Hay*—About 2 tons per acre, being about 12 cwt. more than last year, with rather more clover; although better than last year, not too well secured. *Meadow-hay*—Much the same as last year; badly got, and in many cases wholly lost. *Potatoes*—Very short crop; would yield about $4\frac{1}{2}$ tons to 5 tons per acre; a little disease at lifting; kept fairly well in pits; no new varieties planted. *Turnips*—Average would be about 14 tons to 16 tons; a very irregular crop; on some farms extra good, and on others a complete failure; braided was very slow, and in some instances there were 2 to 3 sowings. *Insects*—No damage by insects. *Weeds*—Crops suffered from weeds—redshank in particular; potatoes and turnips were very badly overrun by this weed, and there was no dry weather to clean them. *Pastures*—Of an average

growth and quality, and slightly better than previous year. *Live Stock* thrived well. Cattle and sheep free from disease. *Clip of wool*—About an average in point of quantity and quality.

STIRLINGSHIRE (Eastern District). *Wheat*—About 40 bushels per acre; poor quality; straw about 25 cwt. *Barley*—About 36 bushels per acre; fair quality; straw 20 cwt.; seed sown, 4 bushels per acre. *Oats*—About 36 bushels per acre; fair quality; straw 20 cwt. per acre; seed sown, 6 bushels per acre. *Harvest*—Late; heavy crops, and badly twisted, very expensive to reap. *Hay*—Heavy crop, and fairly well secured. *Meadow-hay*—Good crop, and fairly well got. *Potatoes*—Good crop; slight disease, owing to the wet season. *Turnips*—Fair crop; good quality; about 16 tons per acre. *Insects*—Nothing unusual. *Weeds*—Rather more weeds than last year, owing to the wet season. *Pastures*—Fairly average growth. *Live Stock* thrived fairly well. Cattle and sheep: no disease since foot-and-mouth abated. *Clip of wool*—Good.

CLACKMANNANSHIRE. *Wheat*—Full average crop of straw, but, owing to the sunless and wet summer, the grain would be 2 bushels less per acre, and very soft; from 30 to 32 bushels per acre; 3 to 4 bushels of seed sown. *Barley*—A little below the average crop; good bulk of straw; want of colour in the grain; yield about 30 bushels per acre; 3 to 4 bushels of seed sown. *Oats*—A good bulk of straw; ripened very irregularly with a good number of greens in the crop; during harvest the weather was showery, but, owing to plenty of wind, the grain was secured in fair condition; average yield 30 to 32 bushels per acre, but the average weight per bushel was about 39 lb. *Harvest* began at the usual time. *Ryegrass-hay*—The crop was over the average in bulk, but the weight was disappointing; the quality, owing to so much rain, was not good; would weigh from 25 to 30 cwt. per acre; Timothy hay was over the average, and secured in better condition generally than the ryegrass; 38 to 45 cwts. per acre. *Meadow-hay*—A good crop, and got in fair condition. *Potatoes*—From 6 to 7 tons per acre; there was very little disease, and among the new varieties there was no disease; the same varieties were planted, being mostly "Kerr's Pink" and "Golden Wonder." *Turnips*—A very irregular crop; on dry land the crop was good, but on wet land the crop was very poor; they braided well, came regularly, and did well after being thinned on dry land, but did not mature well on wet land; yield from 15 to 20 tons per acre; very little finger-and-toe; the drills were easily kept clean this year; very little second sowing. *Insects*—There was very little damage by insects. *Weeds*—Spurry or yarr among oats was pretty general, but very little charlock. *Pastures* were abundant, but, owing to so much rain and lack of sunshine, were deficient in quality. *Live Stock* did not do so well on account of the lack of nourishment in the pasture. Cattle and sheep were free from disease. *Clip of wool* was a fair average.

PERTSHIRE (Western District). *Wheat*—36 bushels per acre; both straw and grain deficient in quantity and quality; crop not too well harvested, as weather was very unfavourable; the area of wheat sown would be under the average. *Barley*—The area under

this crop was less than usual, and the crop generally was not well secured; the yield of grain would not be more than 30 bushels per acre; there was a fair bulk of straw. *Oats*—A full average crop of grain and straw; the yield of grain would be 34 to 36 bushels per acre; in several districts the crop was damaged by wet weather. *Harvest* commenced quite a week later than last year; the middle of September saw harvest pretty general, but in some districts the work was not completed by the end of October. *Hay*—A full crop, but not too well secured. *Meadow-hay*—Very little meadow-hay is grown in the district; the weather was exceptionally unfavourable for securing meadow-hay, and most of the crop was only fit for "bedding." *Potatoes* were a fair crop, in spite of the sunless summer; some of the newer varieties were planted, but in general the bulk of the crop consisted of the older and tried varieties. *Turnips*—Generally a bulky crop, and quite an average; seed braided well, and no second sowing. On account of the continued wet weather there was an abnormal crop of annual weeds. *Insects*—No damage by insects. *Pastures*—There was a plentiful growth of grass. *Live Stock*—Cattle did badly on the grass, as the weather was too cold and wet, and they left little profit on the summer's grazing. *Clip of wool*—Quite an average clip.

PERTH DISTRICT.

FIFESHIRE (Middle and Eastern District). *Wheat*—From 36 to 44 bushels per acre; bulky crop of straw; seeding from $3\frac{1}{2}$ to 4 bushels per acre. *Barley*—Generally a bulky crop; straw soft, on many fields badly lodged, and thrashing out very irregular; from 30 to 40 bushels per acre; samples of grain light, and deficient for malting purposes; seeding 3 to $3\frac{1}{2}$ bushels per acre. *Oats*—From 32 to 56 bushels per acre; straw bulkiest crop for many years; seeding 4 to 6 bushels per acre, according to variety. *Harvest* commenced about first week of September, and continued well into October; grain crops were very badly lodged with the continued wet weather, and most difficult to cut; later-cut fields badly shaken by wind and storm, and the loss in some cases would be from 4 to 12 bushels per acre. *Hay*—From 2 to $2\frac{1}{2}$ tons per acre; many fields secured in very bad condition; quality generally very deficient. *Meadow-hay*—Almost none grown. *Potatoes*—From 2 to 3 tons less than last year; average from 5 to 6 tons per acre; a good deal of disease in certain varieties, and not keeping in pits; "Kerr's Pink" and "Golden Wonder" very sound, and in most demand for ware; no new varieties. *Turnips*—Swedes about 15 tons per acre; crop under an average; Yellows a very bulky crop, and over an average; crop braided well, and came to the hoe very quickly; no resowing; a good deal of finger-and-toe on some fields. *Insects*—Very little damage by insects, the spring being very favourable for the growth of crops in the earlier stages, and the cold wet sunless summer unfavourable to insect pests affecting crops in the later stages. *Weeds*—The wet summer was unfavourable for cleaning green crops; more damage by weeds than usual; charlock not so prevalent. *Pastures*—Grass very plentiful all season; quality deficient. *Live Stock* generally did well, owing to abundance of grass; fattening stock did not finish off as well as usual on the pastures. Cattle and

sheep generally very healthy ; a few cases of anthrax in the county, and on one farm a rather serious outbreak of grass disease amongst horses. *Clip of wool*—About an average.

FIFESHIRE (Western District). *Wheat*—A bulky crop as regards straw ; grain not yielding well to the acre, and the natural weight, like other cereals, is much below the standard ; average yield 32 bushels per acre, and on some lands slightly less ; usual seeding 4 bushels per acre. *Barley*—Crop, like wheat, under an average ; grain 30 to 32 bushels per acre ; natural weight average 49 lb. per bushel, badly matured and of high colour ; straw, good bulk, soft, and of little feeding value ; seeding 4 bushels per acre. *Oats*—This crop being heavy and with soft straw, was badly twisted, and in consequence there was a heavy loss in grain during harvest ; except with the earliest harvested grain, the quality was poor ; average crop up to 48 bushels, and in some cases a little more ; straw bulky and coarse, and much of it unsuited for fodder ; seeding 6 bushels per acre. *Harvest*—1924 will be remembered as one of the worst for many years ; work was started during the second week of September—about two weeks late—and in many cases much later ; most grain had to be cut off one side, and in cases the manual reaper had to be used as well as shearing ; much grain was lost due to shaking during handling. *Hay*—The wet summer encouraged the growth of clovers, and with continued wet the hay crop was bulky in comparison with its weight ; secured in bad condition. *Meadow-hay* was also bulky, and secured in bad condition ; in fact with flooded land some hay was never secured or had to be used for bedding. *Potatoes*—An average yield of 6 to 8 tons per acre ; with some varieties, however, disease was prevalent, and was noticed first about the middle of July. *Turnips*—A very variable crop ; early sowings went to seed, and the feeding value was diminished ; other crops were under an average ; on wet lands finger-and-toe or wet rot reduced the crop. *Insects*—No reports of insect pests. *Weeds* were to be seen everywhere, and as there were very few dry days after the middle of April, it was impossible to clean land and crops. *Pastures* were abundant, but the grass seemed to have little feeding value ; Wild White Clover was blamed for causing scour in sheep. *Live Stock* remained lean all summer, and did not thrive too well ; weather too wet and cold. Cattle and sheep generally were free from disease. *Clip of wool* was of good quality, but if anything under an average of former years ; shearing was interrupted many days by rain or dampness.

PERTSHIRE (Eastern District). *Wheat*—Good average crop as regards bulk ; grain and straw deficient in quality ; yield about 34 bushels ; seed, 3 to 4 bushels. *Barley*—Average crop ; quality of grain and straw inferior ; yield about 34 bushels ; seed, 3 to 4 bushels. *Oats*—Bulky crop, but most of it greatly damaged and secured in wretched conditions ; yield about 40 bushels ; seed, 4 to 6 bushels. *Harvest* began first week of September, and, owing to the abnormally adverse weather conditions, continued for over three months. The crops were much laid and twisted, and a large proportion of them so much damaged that they were only fit for manure. *Hay*—A good bulky crop, but secured in very inferior condition ; much of it quite useless ; yield about 30 cwt. *Meadow-*

hay—Very little grown. *Potatoes*—Earlies a poor light crop and main crops under average; yield 5 to 6 tons. *Turnips*—Generally a good crop on loamy land, but indifferent on heavy soils; some finger-and-toe in places; yield about 18 tons. *Insects*—Not more than usual. *Weeds*—Not more than usual. *Pastures*—Very luxurious during summer, but too soft and wet; became very bare in early autumn. *Live Stock* thrived fairly well, considering the extremely wet weather. Cattle and sheep free from disease. *Clip of wool*—Under average; fair quality.

PERTHSHIRE (Central District). *Wheat*—A large break was sown, and the return was above the average; the wheat was harvested on the whole in fair condition; about 38½ bushels per acre. *Barley*—The crop was fair, but the acreage sown was under the usual average; straw was plentiful; yield would be about 36 bushels per acre, weighing from 50 to 55 lb. to the bushel. *Oats*—About 36 bushels per acre. *Harvest*—The quality of the grain cut in August and early September was fair, but a spell of dry weather set in, and in consequence harvest work was allowed to be proceeded with to the end of September and the first week in October. A good deal of damage occurred on account of the delay in securing the crop in late districts. The grain on some farms was discoloured. Charlock is still unfortunately on the increase. *Hay* was of fair quality and was secured in good order, and the yield was about the average. *Meadow-hay*—The yield was again very unsatisfactory, and a considerable quantity was practically lost on account of the bad weather. *Potatoes* progressed fairly satisfactorily throughout the season, but the want of sunshine hampered the growth. The average would be from 6 to 10 tons per acre. The crop was free from disease, but the acreage planted would be at least one-fifth short of last year. *Turnips*—The yield on the whole was about the average. Swedes did very well. Weight from 12 to 20 tons per acre. *Insects*—Damage was done on some farms. *Weeds* were very plentiful and difficult to keep down on account of the wet and cold summer. Couchweed is still unfortunately on the increase. *Pastures* were good. *Live Stock* generally did well throughout the year. Cattle and sheep were free from disease. *Clip of wool* was of good quality and a full average.

PERTHSHIRE (Highland District). *Wheat*—None sown. *Barley*—Not a patch of barley seen in this district last year. *Oats*—Very heavy crop throughout the district in bulk and length of straw; grain an average return per acre; 28 bushels, but mostly poor quality and very light in natural weight, owing to the sunless season and the incessant rain; most of crop, except on light soil facing the sun, very late in ripening, and did so irregularly. *Harvest* much later than usual; not general till the first week of October; great difficulty in getting crop cut, and much more difficult and expensive to secure. *Hay* a very good crop; about 35 cwt.; difficult to get, but fairly well secured in the end; aftermath very good. *Meadow-hay*—Above an average in bulk; very late in being cut; difficult to secure, owing to rain, and in the glens had to give up cutting in October, as none could be secured. *Potatoes*—Less per acre than last year; about 5 tons; no disease; fair bulk of ware; quality

not so good ; no new varieties planted ; late in being secured, but all got. *Turnips*—Under last year in size and weight ; on the average 14 tons ; some finger-and-toe in places ; crop a little late on being sown, but braided well ; no second sowing required. *Insects*—No injury from fly or insects. *Weeds*—Fields could not be sufficiently cultivated owing to the wet ; couch-grass worse than usual on that account, and this operated all the season against the crop. *Pastures*—Late in coming owing to the barren cold weather of March and the cold wet May, but throughout the summer grass was very abundant, and lasted long into late autumn. *Live Stock* did well all the season, although the want of sun and the cold wet nights were much against beef-making and milk. Cattle and sheep free from disease. *Clip of wool* up to the average and of good quality ; great difficulty in getting hill stocks clipped owing to the wet season.

FORFARSHIRE (Western District). *Wheat*—The quantity of grain was about an average, say, 40 to 42 bushels per acre, but the quality of both grain and straw was deficient ; seed, 3 to 4 bushels. *Barley*—Although some excellent crops of barley were to be seen, weather conditions were much against securing good samples ; grain and straw both of very secondary quality, 34 to 38 bushels per acre ; seed, 3 to 4 bushels. *Oats*—About the end of August oats were the best crop ever seen in this district ; the weather, however, played havoc with it, with the result that many fields were still (1st January) not secured ; grain only secondary, but yielding 48 to 50 bushels ; straw bulky, but in bad condition ; seed, 4 to 7 bushels. *Harvest* late in beginning, and continued to be a vexatious problem right through ; grain was so battered to the ground the ordinary mode of cutting had to be abandoned in many instances ; mowers, scythes, and hooks were resorted to, but still there are to be seen (1st January) fields uncut. *Hay*—Generally a good crop ; 34 to 38 cwt. per acre ; quality very secondary. *Meadow-hay*—Also secured in secondary condition. *Potatoes*—A smaller crop than last year, say, 6 tons per acre, with more disease. *Turnips*—Considering the wet weather, turnips braided wonderfully well, but crop very irregular, and more finger-and-toe than usual ; average weight about 16 to 18 tons per acre. *Insects*—Not much damage by insects. *Weeds*—Owing to wet, weeds were difficult to keep down. *Pastures* were good, and stock thrived wonderfully well considering the continued wet weather. *Live Stock*—There are always a few cases of anthrax in this district ; one or two cases of "Yellows" in lambs occurred ; "grass sickness" has claimed fewer victims. *Clip of wool* was quite up to the average.

ABERDEEN DISTRICT.

FORFARSHIRE (Eastern District). *Wheat*—About 40 bushels per acre, with at least 32 cwt. of straw ; a very fine crop, but the whole return spoiled by the bad harvest ; seed, $3\frac{1}{2}$ to 4 bushels drilled in. *Barley*—A fine crop while growing, but quality greatly destroyed through the bad harvest ; 40 bushels per acre, with 22 cwt. straw ; seed, 3 bushels per acre drilled in. *Oats*—One of the heaviest crops ever grown in this county, but straw and grain damaged entirely through bad weather ; yield anything from 32 to 56 bushels per acre, and straw 25 cwt. per acre ; 6 bushels seed per acre—3 bushels

sown broadcast, and 3 bushels drilled across. *Harvest* commenced on 1st September, an average date, but finished any time between the middle of October and the 1st December. *Hay*—A big crop of over 50 cwt. per acre, but the quality greatly spoiled through bad weather at haymaking time. *Meadow-hay*—A much more productive crop than last year. *Potatoes*—6 tons per acre; a good deal of disease when lifted, and getting worse in the pits; no new varieties planted, but the recently-introduced "Kerr's Pink" is getting more popular every year. *Turnips*—16 to 20 tons per acre; crop braided well, and no second sowings required, but more trouble with canker than is customary in this county. *Insects*—No damage. *Weeds*—Crops injured in some parts by "Skellies," but not so much as usual. *Pastures*—Plenty of pasture everywhere all through the season, but quality poor owing to continuous rains. *Live Stock* did not thrive so well as usual, the ground never being dry. Anthrax amongst cattle more prevalent than usual, with almost one hundred confirmed cases in the county during 1924. *Clip of wool*—A fairly heavy clip of very ordinary quality.

KINCARDINESHIRE. *Wheat*—34 bushels per acre would be an average; seed sown, 3 to 4 bushels per acre; grain was of poor quality owing to want of sun; straw ample in bulk. The area under wheat tends to diminish. It is grown principally for the straw to be used in potato pits or for thatching, and on the less suitable soils farmers are growing rye and even tying winter oats and barley. *Barley*—A poor crop in many places; 32 bushels per acre; very light owing to want of sun; it was also damaged owing to rain during harvest; 4 bushels per acre would be the normal sowing. *Oats* would have been a heavy crop, but were so badly laid that a large proportion of the grain was left in the fields; 42 bushels per acre, but a large proportion of this was light grain; straw rank, and of poor feeding quality. The quantity sown depends on the variety: a thin-skinned oat drilled 5 bushels, broadcast 6 bushels; a thick-skinned oat would require 2 bushels more. *Harvest* was ten days to a fortnight later than usual in commencing, and was very prolonged; some crops were still out in December. *Hay* generally a very heavy crop; might average 45 cwt. per acre; it was difficult to win, and was much damaged by the weather. *Meadow-hay*—None grown. *Potatoes*—Much the same as last year; average 5 tons per acre; the area would be much the same as in 1923. There was a good deal of disease; it started towards the end of August; new varieties are always being tried in small quantities. *Turnips*—13 tons per acre; Swedes 16 tons; the braird was good, and practically no trouble with fly; owing to the continued wet and want of sunshine, turnips have less feeding value than usual. *Insects*—All grain crops were considerably damaged by wireworm; this is encouraged by indifferent ploughing; many farmers who have tried new types of ploughs are again taking up the swing plough, especially for lea. *Weeds* were very difficult to control; "Skellies" were more prevalent than usual. *Pastures*—Very strong growth; stock had difficulty in keeping down the grass; the quality was rank and poor. *Live Stock* did not make the expected increase in weight; no serious outbreaks of disease in the county. *Clip of wool*—Poor, and below the average in weight.

ABERDEENSHIRE (Buchan District). *Wheat*—None grown. *Barley*—About 35 bushels per acre; quality of grain and straw much better than was expected, except in some cases where the crop was late in being secured; seed sown, 4 bushels per acre. *Oats*—40 bushels per acre; in many cases much less where the crop was laid flat, and consequently shed much of the grain; quality of grain and straw, except in some early districts, much below the average; quantity of straw above the average; seed sown, about 6 to 6½ bushels. *Harvest* commenced about the usual time. *Hay*—About 3¼ tons per acre; quality was a little superior to the average of recent years, both as regards rye-grass and clover. *Meadow-hay*—Very little meadow-hay grown. *Potatoes*—Potato crop was a large one, and above last year in quantity; 8 to 10 tons per acre; disease broke out very badly in the pits, and in many cases not half the crop was left; few new varieties grown. *Turnips*—Much better than last year; about 16 tons per acre on an average; crop braided well, and very little second sowing required. *Insects*—No damage. *Weeds* of all varieties were more plentiful than usual; ground was very wet and “raw” when seeded; weeds were consequently never thoroughly eradicated, and with the wet spring continued to grow. *Pastures*—A little under the average growth and quality. *Live Stock* thrived fairly well; summer was too wet, with lack of sunshine, for stock to thrive really well. Cattle and sheep were free from disease; pleuro-pneumonia seems to have been again stamped out. *Clip of wool*—Very few sheep in the district.

ABERDEENSHIRE (Central District). *Wheat*—None grown. *Barley*—30 bushels per acre—2 bushels more than last year; straw, 23 cwt. per acre—5 cwt. more than last year; quality of both grain and straw inferior to that of last year; natural bushel weight of grain ranging from 50 to 56 lb.; seed sown, from 3 to 3½ bushels per acre, where drill sowing machine used; 4 bushels per acre where broadcast sowing machine used or sown by hand. *Oats*—40 bushels per acre—3½ bushels more than last year; straw, 25 cwt. per acre—9 cwt. more than last year; quality of both grain and straw very irregular, and on an average not so good as last year; natural bushel weight ranging from 35 lb. to 45 lb; seed sown: potato and all their husked varieties from 5 to 5½ bushels per acre where drill sowing-machine used, 6 to 7 bushels per acre where broadcast sowing-machine used or sown by hand; all thick-husked varieties, from 2 to 2½ bushels per acre extra. *Harvest*—Much about the same time as last year. Barley harvest commenced from the second to third week in September, oat harvest from the third week to end of September. Barley harvest mostly completed by the 15th October—about 15 days later than last year. Oat harvest mostly completed by 31st October—about 13 days later than last year. Summer was sunless, with an abnormal amount of rain, consequently crops were very much laid; harvest operations were protracted and expensive. In both barley and oats there is a very much larger proportion of immature grain than in a normal season. *Hay*—30 cwt. per acre—2½ cwt. more than last year, though quality not so good, but generally as well mixed with clover. *Meadow-hay*—24 cwt. per acre—4 cwt. more than last year; quality not so good.

Potatoes—About 5 tons per acre—much about the same as last year. Disease was prevalent, and was to be seen in August; on harvesting the loss by disease was at least 25 per cent. and more in non-immune varieties compared with immune varieties; “Duke of York” were almost wiped out if left too long in the ground; “Golden Wonder” also suffered more than average. No new varieties reported; varieties planted much the same as last year. *Turnips*—13 tons per acre—1 ton less than last year; crop braided quite satisfactorily; the summer, however, was much too wet for some kinds of soils, especially fields with a northern exposure; the crop was very irregular—some fields a good crop, some a very poor crop; finger-and-toe prevalent. *Insects*—No injury by insects reported. *Weeds*—Surface weeds, such as chick, yarrow, &c., much more in evidence than in a normal season. *Pastures* during the season were of more than average growth, but not generally supposed to be of so good quality as last year. *Live Stock* thrived quite satisfactorily. Foot-and-mouth disease in adjacent parish, but no disease in central district. *Clip of wool*—An average; very much the same as last year for quantity and quality, but farmers are getting a much better price.

ABERDEENSHIRE (Strathbogie District). *Wheat*—None grown. *Barley*—The Strathbogie or Huntly district being somewhat late, the tendency has been in recent years to diminish the area under this cereal. The season being cold, wet, and sunless, was most unfavourable for its production, with the result that a large proportion of the crop was early laid by the rains, so that the grain did not reach maturity. The return of grain may be estimated at 28 bushels per acre, but scarcely any of it reached the natural weight of 56 lb. per bushel, and much of it quite unfit for distilling purposes. The general weight may be stated to range from 48 to 57 lb. per bushel. *Oats* suffered in much the same way. Much of the crop on the richer lands was laid early in the season, therefore never reached maturity. In not a few instances considerable breadths were cut and fed to cattle indoors. Had the season been favourable, the crop would have given a great yield. The general average may be stated at 28 bushels per acre of grain suitable for selling. The weight may be stated to run from 34 to 40 lb. per bushel. In not a few instances farmers will have to purchase all their seed requirements, as it would not be wise to trust to the home growth. *Harvest* was very late—at least from two to three weeks behind the usual time. Reaping was a tedious job, so much time was required to get the crop into stook; it was in many instances well on to Martinmas before all was secured in stack, with much of it in very indifferent condition. *Hay*—Fairly good as regards bulk, but great difficulty was experienced in getting it cut, cured, and stacked in anything like fair condition. As there is now little market for hay, owing to the extensive use of motors, the tendency has been in recent years to reduce the area under this crop. *Potatoes*—Crop was generally unsatisfactory; tubers were small in the run and few at the stem; “Golden Wonder” has been receiving increased attention of late years, as also has “Crusader” since it became known in the district. *Turnips*—Crop very variable. On light kindly soils the weight per acre was fairly good, but on retentive soils which did not give suffi-

cient drainage for the heavy rainfall the yield was much below an average; the plants came along to the hoe all right, but some difficulty was found in keeping the land clean during the growing season. Fortunately, owing to the open season, growers got the benefit of the tops, which saved a proportion of roots. *Insects*—There was no damage caused by insects. *Pastures*—Grass was quite plentiful during the whole of the season, but graziers complained that stock did not thrive so fast as was desirable, this being no doubt due to the coldness of the season and the superabundance of moisture. *Live Stock*—Cattle and sheep have been free of disease. *Clip of wool* was good as regards weight, and the quality quite satisfactory.

BANFFSHIRE (Lower District). *Wheat*—None grown. *Barley*—Much the same as last year; 35 to 40 bushels per acre; weight, 53 to 56 lb.; seed sown, 4 to 5 bushels per acre; straw more abundant; quality fairly good. *Oats*—Lighter than last year, owing to crop being badly laid; from 38 to 42 lb. per bushel; straw more abundant; quality poor. *Harvest* began about first week of September—slightly later than usual,—but was prolonged owing to wet weather into November. *Hay*—Quantity more than last year; about 40 cwt. per acre. *Meadow-hay*—Practically none grown. *Potatoes*—Better than last year; first earlies 4 to 5 tons; lates up to 10 tons; disease in first earlies and in "Champions," others free; no new varieties planted. *Turnips*—About 20 tons; quality poorer than last year; crop braided well; only one sowing required; finger-and-toe reported on many farms. *Insects*—No injury by insects. *Weeds*—Not to any extent. *Pastures* did well during season. *Live Stock* did well on the whole. Cattle and sheep have been free from disease; foot-rot in sheep seemed more noticeable. *Clip of wool*—Quality good, and quantity about average.

BANFFSHIRE (Upper District). *Wheat*—None grown. *Barley*—A very limited area sown; farmers had fears of a recurrence of the failure of seasons 1922-23; the crop seemed all right in growth, but lack of sunshine prevented filling and ripening; the returns are only 3 to 4 qrs. per acre of from 50 to 52 lb. per bushel. *Oats*—A bumper crop of straw suffered from want of sunshine, same as the barley crop; a succession of tempests of wind and rain knocked down the crop several times, and much of that laid early never filled; bushel weights are as low as 35 lb. per bushel; stackyards are a third above average, and of hard ground grain is up to 42 lb. *Harvest*—The excessive rainfall, accompanied by moderate heat throughout the summer, kept crops growing and held back ripening right on to middle of September; a most successful harvest was secured in the latter part of September and October. *Hay* crop was a good average, well mixed with clovers and rye-grass; haymaking was most laborious, owing to the wet; the process extended on to eight weeks, and there were portions of the crop much damaged. *Meadow-hay* is not in evidence; haughs and borders go along with pastures. *Potatoes* are only grown for home use. They came out fairly well—6 to 8 tons per acre; much superior to last season; disease affected some varieties to a small extent, and the pits were periodically examined to separate out the diseased tubers. *Turnips*—Crop variable; good heavy loams come up to 16 or 18 tons, but damp flats or thin

soil are less than half those quantities ; no second sowing required. *Insects*—No damage ; Possibly the continued rains drowned most of the parasites. *Weeds* were very much in evidence, and all attempts at drill harrowing and shimming were of no avail. *Pastures* came out well in June and July, but failed too soon, and aftermath of hay was meagre. *Live Stock* came out well at first, but stuck later, unless where the rations were supplemented by hand. Happily no trouble to complain of ; the so-called “grass-disease” was thought to be subdued somewhat by the wet season. *Clip of wool* about the average.

INVERNESS DISTRICT.

MORAYSHIRE. *Wheat*—Very little grown ; and that being in the earliest parts of the county escaped the bad weather at harvest ; yield about 25 cwt. and 40 cwt. straw—same as last year. *Barley*—About 18 cwt., or 4 cwt. more than last year ; straw about 24 cwt., or 6 cwt. more than last year ; weight of grain about 50 lb., or 6 lb. under standard ; colour poor ; seed sown, $1\frac{1}{2}$ to 2 cwt. *Oats*—About 14 cwt., or 3 cwt. more than last year ; quality indifferent ; weight 40 lb. per bushel, or 2 lb. under standard ; quality of straw moderate ; quantity about 35 cwt., or 10 cwt. more than last year ; seed sown, 2 to 3 cwt., according to variety. *Harvest*—Very difficult ; crops were heavy, and mostly laid flat by bad weather ; a lot of the grain was shaken out and lost ; most satisfactory crops this year were on the light, dry, sandy soil. *Hay*—About 30 cwt. per acre, or 7 cwt. more than last year ; well mixed, and secured in good order. *Meadow-hay*—Little grown ; fully more than last year. *Potatoes*—About 4 tons, or same as last year ; very little disease ; a pronounced feature was the strong tops, which were not followed up by a heavy crop of tubers. *Turnips*—About 24 tons, or 7 tons more than last year ; quality good ; “canker” a little more noticeable than of late years. *Insects*—No noticeable damage. *Weeds*—No noticeable damage. *Pastures*—Considerably better than last year. *Live Stock*—Cattle thrive well ; sheep fully healthier than the year before ; horses still troubled with “grass sickness.” Cattle and sheep free from disease. *Clip of wool*—Above the average.

NAIRNSHIRE. *Wheat*—Not grown to any extent. *Barley*—A good crop, but considerably damaged owing to the wet and stormy weather prevailing in harvest ; straw bulkier than for some years. *Oats*—A good crop, but much grain lost owing to the high winds and protracted harvest ; there would be a loss of from 5 to 7 bushels per acre from these causes. *Harvest* began about the usual time, but was very protracted. *Hay*—A very good crop, the best for several years, both as regards rye-grass and clover. *Meadow-hay*—None cut. *Potatoes*—A small crop ; 4 to 5 tons per acre ; disease more or less general, beginning towards the end of July. *Turnips*—A medium crop of, say, 12 tons per acre ; not equal to last year ; the crop braided well ; only one sowing required. *Insects*—No injury. *Weeds*—All kinds of weeds were troublesome this season. *Pastures*—The pastures were very much better than for several seasons. *Live Stock* thrive well. Cattle and sheep free from disease, excepting a few cases of “grass sickness” in horses. *Clip of wool*—Over the average in quality and quantity.

INVERNESS-SHIRE (Inverness District). *Wheat*—The area under wheat was very small; about 40 bushels per acre, 60 lb. to the bushel; straw about 36 cwt. per acre; seed, 4 bushels per acre. *Barley*—Area sown about average extent; quality not up to an average season owing to the excessively wet summer, and much of the crop badly laid and twisted; about 32 bushels per acre, 52 lb. per bushel; straw 28 cwt. per acre; seed sown, 4 bushels per acre. *Oats*—Much inferior grain, and a very bad return; crop was much destroyed before harvest; about 32 bushels per acre, 40 lb. per bushel; straw 28 to 30 cwt. per acre; seed sown, 4 to 8 bushels per acre according to variety. *Harvest*—A late bad harvest—possibly one of the worst during the last thirty years. *Hay*—Quantity below an average season; quality in many cases very inferior; clover deficient. *Meadow-hay*—Practically none grown. *Potatoes*—Less than last year; about 4 tons per acre; early varieties badly affected by disease commencing about August. *Turnips*—About the same as last year—16 to 18 tons per acre; the crop braided well; no second sowing. *Insects*—No damage. *Weeds*—Nothing out of the usual. *Pastures*—Too wet and cold; quality poor. *Live Stock* thrived in a way; very little feeding. Cattle and sheep free from disease. *Clip of wool*—Average.

INVERNESS-SHIRE (Skye). *Wheat*—None grown. *Barley*—None grown. *Oats*—This crop was better than the crops of last few years, and was secured in good condition. *Harvest* commenced about 15th September—fully two weeks earlier than last year. *Hay*—Rye-grass a light crop, and not well secured, weather being wet in August; Clovers do not grow well in the island. *Meadow-hay*—Crop lighter than average; cut later than usual, but was secured in good condition. *Potatoes*—Much better crop than last year, but quality only fair; stormy weather usually injures this crop in Skye. *Turnips*—Only grown on a small scale in the island, but crop much better than last year. *Insects*—Very little damage. *Weeds*—Not more injurious than usual, but always plentiful and do a lot of harm. *Pastures*—Scarcely as good as usual. *Live Stock*—Not in good condition until late in the season; the good weather of October and November helped sheep very much, and they were in good condition at back end of year; very little disease among cattle and sheep. *Clip of wool*—A good average clip.

INVERNESS-SHIRE (Lochaber). *Wheat*—None grown. *Barley*—None grown. *Oats*—A good crop; 6 bushels per acre sown. *Harvest*—Earlier than last year, but long drawn out owing to wet weather. *Hay*—Crop good and well got. *Meadow-hay*—Same as last year. *Potatoes*—A moderately good crop, but signs of disease in places owing to wet season. *Turnips*—A fair crop; in many places finger-and-toe showing; no second sowing required. *Insects*—No damage. *Weeds* prevalent owing to wet seasons. *Pastures*—Same as last year. *Live Stock* thrived; cattle and sheep free from disease. *Clip of wool*—Quantity and quality improved.

ROSS-SHIRE (Dingwall and Munlochy). *Wheat*—Very little grown; about 4 to 4½ qrs. per acre; seed sown, 3 to 4 bushels. *Barley*—Quality of grain below average; 30 to 38 bushels per acre; quality

and quantity of straw average; seed sown, $3\frac{1}{2}$ to $4\frac{1}{2}$ bushels per acre. *Oats*—A very fine crop of both grain and straw, but both very much damaged by bad weather; yield 44 to 68 qrs. per acre; very few good samples of grain owing to the crop being so much lodged. *Harvest* began about 1st September—a fortnight later than the usual date; was very long and tedious owing to the wet weather and the crop being so much lodged. *Hay*—Quality average; yield $1\frac{1}{2}$ to $1\frac{3}{4}$ tons per acre. *Meadow-hay*—None grown. *Potatoes*—From 4 to 6 tons per acre; a good deal of disease in early varieties; quality below average. *Turnips*—Crop much below average, owing to finger-and-toe; Swedes, 10 to 20 tons per acre; yellows, 6 to 15 tons per acre; crop braided well; very little resowing, if any. *Insects*—Crops were not injured by insects. *Weeds*—No injury. *Pastures* were abundant all the year. *Live Stock* thrived well. Cattle and sheep free from disease; foot-rot was bad, owing to so much wet weather. *Clip of wool*—Quality good, and clip quite up to average.

ROSS-SHIRE (Tain, Cromarty, and Invergordon). *Wheat*—About 32 bushels per acre, being about same as last year; quality poor, summer being too cold and wet for this crop; straw about normal; average sown, about 4 bushels per acre. *Barley*—About 32 bushels per acre, being about same as last year; quality poor, and weight per bushel light on account of cold wet summer; some fields were badly shaken by wind, in some cases as much as 2 to 3 qrs. per acre being lost; average sown, $3\frac{1}{2}$ bushels per acre; straw poor quality. *Oats*—About 52 bushels per acre, being about 2 bushels less than last year; quality poor; crop was mostly flat, and, with wet weather, took a long time to cut, consequently crop got too ripe before being cut, and there was a lot of shaking, in some cases 1 to 2 qrs. being left on ground; straw poor quality; seed sown per acre, 4 to 6 bushels according to variety. *Harvest* started about 8th September, being about one week later than usual. *Hay*—A good crop; about 35 cwt. per acre; quality quite good. *Meadow-hay*—None grown. *Potatoes*—Average yield $5\frac{1}{2}$ tons per acre—about $\frac{1}{2}$ ton less than last year; much more disease than last year; not many new varieties planted; quality quite good considering season; disease started about middle of August. *Turnips*—Swedes about 22 tons per acre; yellows about 19 tons per acre; quality good; crop braided well; very little resowing. *Insects*—More damage than usual from grub in grain crops. *Weeds*—Charlock, as usual, fairly bad in certain fields; this weed appears to be increasing. *Pastures* were very rich all through the season, and quality seemed quite good, notwithstanding wet weather. *Live Stock* thrived well. Cattle and sheep free from disease. *Clip of wool*—Normal.

SUTHERLANDSHIRE. *Wheat*—None grown. *Barley*—Season similar to last year; too much grain and very little sunshine; straw plentiful in quantity but poor in quality; very badly laid and twisted; cutting most difficult; grain of poor quality, lacking colour and weight; about 4 bushels per acre sown. *Oats*—Abundance of straw, but crops laid and twisted very badly; grain poor in quality in consequence; too much laid stuff for a good sample to be easily procured; leading in was not so difficult; good weather for this work during the month of October, the weather being dry and breezy;

thick-skinned varieties, such as "Yeilder" and "Victory," sown from 6 to 6½ bushels, with "Hamilton" and "Potato" about ½ to 1 bushel per acre less. *Harvest* began about the 10th to 15th September, some cases a little earlier; cutting the most difficult for many years, a great deal of the crop being laid flat; scythe work much more common than for many years; cutting would be finished about the first or second week in October; leading much better than last year, the weather being open and dry; finished a few weeks earlier than last year, and in much better condition. *Hay* a medium crop; in some instances quite up to the average, and in others a light crop; an absence of clover all over; hay harvest, although not very good, distinctly better than 1923; secured in fair condition, and earlier by a fortnight than last year. *Meadow-hay*—No meadow-hay on this, the east side of the county, but in the interior and west a fair crop; secured in fair condition—a contrast to 1923, when this crop was almost entirely destroyed by the continuous rain. *Potatoes*—A fair crop in some instances, but considerable loss by disease; where no disease was evident the crop was somewhat light; perhaps a better yield than last year, but this in a good many cases discounted by disease; the newer varieties are now firmly established as compared with, say, "Champions," which are very little in evidence now. *Turnips*—The summer and early autumn too wet for turnips, but notwithstanding being much milder than last year, turnips did fairly well; the back end was very favourable, being free from frost and good for growth; a better crop generally than last year; braided pretty well, and no second sowing of any consequence. *Insects*—Not much damage by insects. *Weeds* did a good deal of damage; owing to continuous rains difficulty was experienced in keeping them down; damage from this source somewhat similar to last year. *Pastures* of more than average growth, owing to mild wet weather, but quality lacking for want of sunshine. *Live Stock* thrived fairly well, but too little sun and too much rain to be entirely successful. Cattle and sheep have been free from disease, except that foot-rot in sheep was very troublesome on account of long wet grass. *Clip of wool* about the average; of good quality.

CATHNESS-SHIRE. *Wheat*—None grown. *Barley*—About 2 per cent. of grain crop is bere or barley; it grows quite well, producing between 4 to 5 qrs. per acre; from 4 to 4½ bushels of seed sown; cattle do not relish straw, and this accounts for the small proportion grown. *Oats*—The favourite grain crop is oats, of which there are many varieties tried; "Hamilton," "Victory," and "Potato" oats have their supporters, but the most desired after the experience of many seasons is "Sandy"; its straw makes good fodder, though the yield in grain is less; about 3 to 5 qrs.; thick-skinned varieties may be 6 to 7 qrs. per acre; 4, 5, 6, or 7 bushels seed, according to soil. *Harvest* began earlier than in 1923, which was exceptionally late; about the middle of September cutting was in full swing; in four weeks' time the most of the crops were secured; the weather for putting in was very favourable, and was a contrast to last year and to places farther south. *Hay*—Crop was light, barely 1½ to 2 tons per acre; last year's disastrous harvest was against the start of the young grass, and the spring weather was often cold and wet;

the summer got warmer, and clovers made some headway, but not up to the usual. *Meadow-hay* being later, responded to the warmer weather, and was quite up to former years. *Potatoes*—Yield was much better than last year, which was a failure; imported seed was a necessity, and the change of seed from other counties retrieved the situation; new kinds did well till blight affected them; about 7 tons per acre of "King Edward," "Arran Comrade," or "Champion." *Turnips*—Crop came on slowly at first, but the latter part of the season favoured good bulbing, and growth continued on with little frost to the end of the year; yellows might come to 20 tons per acre; Swedes were less in size; there are places, however, so affected by finger-and-toe that a cart load might take the yield of an acre. *Insects*—Grub made havoc of patches in many fields, and thinned many of the lays; some revived afterwards; it was thought that the larvæ of *Tipula oleracea*, here called "Spinners" or "Leather Jacket" or "Daddy Long-legs," was responsible; the damage was greater than usual. *Weeds*—Charlock flourished among the oats, making the fields yellow; Spurry, here called "Carrau," and Sow Thistle, with (Cnicus) and coltsfoot, got a hold last year among the turnips, when little or no scuffling could be done. *Pastures* became very much infested with buttercups, which showed unusual abundance; the season continued remarkably fresh, and Wild White Clover gave a verdant appearance in places where it was not sown. *Live Stock* kept in thriving condition; there were instances in which cows did not prove in calf, which were difficult to explain. Cattle and sheep—the tuberculin test is not generally applied, and tuberculosis is the most formidable disease that farmers would like to see exterminated, as well as anthrax and sheep scab. *Clip of wool*—The quality of wool was up to the average; judicious mating produces good fleeces from Cheviots and the "half-bred" between Cheviot ewe and Leicester tup.

ORKNEY. *Wheat*—None grown. *Barley*—About 34 bushels per acre, weighing 49 lb. per bushel; seed, $3\frac{1}{2}$ to $4\frac{1}{2}$ bushels per acre. *Oats*—Season 1923 was the worst in the memory of the oldest inhabitant; last season was one of the best; crops were rather backward at first, but the fine summer and autumn improved all the crops; there was a good crop of oats and straw; yield of oats about 34 bushels per acre, weighing about 39 lb. per bushel, being about 2 qrs. per acre more than last year; seed, 4 to 6 bushels per acre. *Harvest* began in the third week of September, being about the usual time, but three weeks earlier than last year. *Hay* was rather a light crop, weighing about 17 cwt. per acre. *Potatoes* were a good crop, but were somewhat injured by blight; yield, about $6\frac{1}{2}$ tons per acre. *Turnips* were an excellent crop; yield, about 15 tons per acre, being about 6 tons more than last year. *Insects*—There was some damage done by grub. *Weeds*—Not much damage. *Pastures* were backward at first, but improved with the fine weather, and were much better than last year. *Live Stock* thrived fairly well, and cattle and sheep were free from disease. *Clip of wool*—The clip of wool was rather under the average.

SHETLAND. *Wheat*—None grown. *Bere and Oats*—The grain crop in Shetland turned out very satisfactory last season; the

average for here would be about 26 bushels per acre, 51 lb. per bushel. *Oats*—25 bushels per acre; weight about 32 lb. per bushel. *Harvest* began about the usual time, and the crops were stacked in good condition; no grain was lost through being shaken by gales. *Hay*—The rotation hay crop was slightly better than last year; the average weight would be about 25 cwt. per acre. *Meadow-hay* was much better than last year; the average weight would be about 18 cwt. per acre. *Potatoes*—Crop was much better than last year; no disease was reported; the average weight would be from 6 to 6½ tons per acre. *Turnips*—Crop would be much about the same as last year; the crop braided all right, and only one sowing was required; finger-and-toe reported from some districts; the weights would be from 12 to 13 tons per acre. *Insects*—No damage was done by insects. *Weeds*—No damage was done by weeds. *Pasture* was very good; better than last year. *Live Stock* did very well on pasture. The county has been clear of cattle and sheep diseases. *Clip of wool*—The wool clip would be about the usual average for weight and quality.

THE WEATHER OF SCOTLAND IN 1924.

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THIS report consists of (1) a general description of the weather over the Scottish area from month to month; and (2) a selection of rainfall returns in which each county of Scotland is represented by one or more stations. It is to be noted that all the temperature readings referred to are, unless otherwise stated, from thermometers exposed in the regulation "Stevenson Screen."

JANUARY.

The year 1924 opened with rather mild weather; but there was a very wintry spell from about 8th to 12th, and another short-lived incursion of cold air on 17th and 18th. Except at these times south-westerly winds were much in evidence, and from 22nd onwards temperature was high for the time of year, though there was nothing approaching such extreme mildness as was experienced in January 1923.

Precipitation was above the average in Fife-shire, in parts of Forfarshire and Perthshire, and to the south of the Forth-Clyde line, with a large excess in the extreme south-west. Towards the north, on the other hand, there was in general a deficiency—very decided in the upper Spey valley, where the month appears to have been the driest January since 1887. Snow between 8th and 11th, and again on 17th and 18th, was in each case followed by heavy rain, and from 18th onwards there was rain on every day towards the north-west. On 25th and 26th there were heavy falls in many western districts; but in eastern districts fair to fine weather from 23rd onwards was interrupted only by moderate falls on 26th.

The weather was very stormy around 12th, and again from about 22nd to 26th. There appeared to be a definite discontinuity between heavy snowfalls on night of 9th-10th, and further considerable falls on 10th and 11th, and the swift transitions on 12th and again on 18th, from snow to thaw and heavy rain, were noteworthy. On the night of 12th many rivers were in high flood.

Sporadic thunderstorms towards north-west about 12th and 25th were typical of mid-winter; the month's moderate amount of sunshine was largely accounted for by a few very

sunny days, and a brilliant display of aurora was widely observed on the night of 29th-30th.

FEBRUARY.

The mild conditions which had characterised the last ten days of January continued during the first week or so of February, but towards the middle of the month easterly winds brought exceptionally cold days. Thereafter temperature was never more than moderate, the month closing with bitterly cold weather. It is noteworthy that the mean temperature of the nights was distinctly above the average.

To the south of the main Grampian range the month's precipitation was very small. Considerable areas had only one-third or less of the normal, and many places aggregates of only one-third of an inch or less. In the north, as a result of the "rainfall equivalents" in a great snowstorm at the end of the month, amounts approached the normal, and in the Spey valley there was an excess. The most general rain occurred on 17th, but during the first week there were some moderately heavy falls towards the north-west. Within the driest area amounts were, as a rule, hardly so small as in February 1921, and it may be recalled that in that month practically all districts were very dry, and that but little snow was experienced.

Wind force was at times very high, with a violent north-westerly gale on 29th, when a "blizzard" set in in the north with very serious drifting. In the north and north-east of Scotland trains were snow-bound and roads impassable. Earlier in the month there was fairly heavy snow in some districts on 12th, with trifling falls on other days.

Thunderstorms occurred only very sporadically, and sunshine aggregates were below the normal, though during the latter half of the month there were some very sunny days.

MARCH.

With unusually frequent winds from north-east and east the month was both very cold and very dry. During the second week, indeed, milder conditions prevailed, but during the first few days the weather was bitterly cold, and from 16th onwards temperature seldom rose above a moderate level. The month as a whole was much colder than either January or February, and the nights were almost throughout exceptionally cold, with a reading as low as 2° F. at Balmoral on the night of 2nd-3rd.

In practically all mainland districts the month's precipitation was low to abnormally low—at Stornoway and in Shetland

there was a slight excess—and in some areas amounts were hardly more than nominal. At Fort-William the aggregate represented only 8 per cent of the normal; at Glenquoich, in the West Highlands, the month was the driest March in a record which goes back to 1876; and at Marchmont, in Berwickshire, it was the driest March for at least fifty years. In north and north-west there were moderate falls during the first week or so, with snow on several days, and in some more northerly districts trifling to moderate falls from 15th to 18th. The period from 21st to 25th was a generally unsettled one, and towards the south-east there was hardly any precipitation except at that time.

The "blizzard" which had set in in the north of Scotland on 29th February spread to north-western districts, and did not quite expend its violence for two or three days. Later there were moderate falls of snow in some districts about 18th and 22nd.

There was a noteworthy absence of thunder.

There were some very sunny days. Towards the south-east of Scotland sunshine aggregates were above the average, and at Edinburgh the month was the sunniest March since 1913.

APRIL.

Cold easterly winds were very prevalent, but, with a short spell of warm weather around 20th, the mean air temperature of the month approached the average, and the month was less cold than the April of 1922 and much less cold than that of 1917. The temperature of the soil, however, was very deficient, and vegetation in a backward state. At Dumfries, for example, the soil at a depth of 4 ft. was colder than in any April since 1917.

Relatively to the normal the distribution of rainfall varied considerably. Over fairly-wide areas there was a deficiency, most marked in the Spey valley. At Lerwick, on the other hand, the aggregate was fully two and a half times the average allowance for April, and in the Clyde area, parts of Perthshire, and the south of Scotland there was a moderate excess. The most general rains fell between 24th and 27th, and at, *e.g.*, Stirling about two-thirds of the aggregate was accounted for during these four days. In some western districts rain fell on every day from 6th to 20th, but the falls were mostly moderate, though fairly heavy on 15th and 18th. In eastern districts there were many rainless days.

Snow fell rather widely on 9th and 10th, and on 11th very heavily in Shetland, where the storm was the worst experienced for many years. On the 13th and 14th there were further snowfalls in various districts.

Thunder was reported rather widely on 15th, and in Morayshire on 28th. There were a few very sunny days, but in most districts sunshine aggregates were below the normal, though at Edinburgh rather above it.

MAY.

A striking feature of the month was the almost persistent coldness of the days, and only in the south of Scotland did temperature reach 70° (72° at Dumfries on 29th). The nights, on the other hand, were often mild, as a result of cloudy skies and consequent restriction of terrestrial radiation. The temperature of the soil remained much below the normal, and vegetation was very backward for the time of the year. Roughly, temperature may be described as having been low until 9th, moderate for the next ten days, and very variable from 20th onwards.

In many districts the month challenged comparison with the notoriously wet May of 1906. Towards the north-west, indeed, rainfall was rather below the normal, but elsewhere there was a more or less decided excess. In East Lothian and Berwickshire the month was less wet than the May of 1906, though aggregates were fully twice the normal, as was the case in West Perthshire and the region round the Beaulieu Firth. The period from 10th to 20th was relatively dry, but very heavy falls occurred towards the north-east on 2nd, 6th, and 7th (2.39 in. at Ardrross Castle, in Ross-shire), and over a large area on 9th. Later there were heavy falls in Perthshire on 25th, and towards the south-east on various days.

Early in the month quite wintry weather was experienced, and thunderstorms were unusually frequent. The most widespread and important of these occurred on 7th, 12th, and 25th.

The month was everywhere cloudy; at Aberdeen it was the cloudiest May on record.

JUNE.

The weather was at first very cold, but towards the end of the second week there was a marked rise of temperature, whilst towards the end of the month conditions were rather variable. The days were, on the whole, decidedly cold; but the mean night temperature was practically equal to the normal, and by the end of the month the soil at a depth of 1 ft. had reached the average warmth for the time of year. At lower depths it was still deficient in temperature.

Towards the north-west rainfall was appreciably above the average, but elsewhere the distribution was rather irregular, with a definite shortage in the south and a moderate deficiency in parts of Perthshire and some eastern districts. The period from 5th to 12th was nearly everywhere wet or moderately so; from 13th onwards rain was almost unimportant in eastern districts, except on 21st and 28th; whilst from 25th onwards very unsettled conditions prevailed in north-west.

Thunderstorms were again frequent, though rather less so than in May. The most widespread were experienced on 11th and 21st.

The month was again very cloudy except in east and south-east, where some very sunny days brought sunshine aggregates above the average.

JULY.

At first temperature was decidedly low for midsummer, but about 9th there was a decided rise to a maximum for the month on 12th (81° at Fort-Augustus and 80° at Kelso and Dumfries), and the weather remained fairly warm for about a week. There was then a return to colder conditions. As in May and June, the mean night temperature differed little from the normal, whilst the days, on the whole, were distinctly cold. The temperature of the soil remained deficient.

Over nearly the whole of Scotland rainfall was above the average, in many districts decidedly so; but in South Ayrshire amounts were just about the normal. During the first ten days rather heavy rains were of the south-westerly cyclonic type; on 12th and 13th there were heavy falls in short periods during thunderstorms; and fair to fine weather from 18th to 22nd was followed by general rains during the next three days. From 28th onwards miserable conditions prevailed in eastern districts, with incursions of easterly winds and heavy rain. At Aberdeen there has been only one wetter July during the last fifty years—in 1918.

Thunderstorms were again very frequent, and one on the late afternoon or early evening of 12th was of unusual severity, and widely experienced.

The month was decidedly cloudy in all except north-western districts.

AUGUST.

There was a singular absence of really warm weather, and over considerable areas temperature failed to reach 70°; but whilst the days were frequently cold, night temperature was, as a rule, fairly high, and the extremes for the month were very moderate. Orkney and Shetland formed an exceptional

area with a mean for the month decidedly above the normal, and apparently the weather in Shetland was throughout the month finer than in any mainland district in Great Britain or Ireland.

After fairly general rains until 6th, followed by a brief fine spell, conditions had again completely deteriorated by 12th, and in some districts there was rain on every day thereafter until the end of the month. On 16th heavy falls occurred in the south, whilst during the week ending 23rd some abnormally heavy rains were experienced around the Moray Firth, in the middle and lower Spey valley, and in the inland districts of Aberdeenshire. Considerable areas had between 3 in. and 4 in. of rain for the week; Logie-Coldstone, in the hilly region between the Dee and the Don, as much as 4.75 in., and Inverurie as much as 4.34 in. Conditions were at their worst on 22nd, when a severe thunderstorm was widely experienced, and on that day Inverurie registered as much as 3.25 in., or more than the rainfall at Edinburgh for the whole month, and Logie-Coldstone as much as 2.75 in. Later there were heavy falls in many districts on 26th and 28th. In some parts of the areas visited by the disastrous rains just referred to the month's total approached twice the normal; but elsewhere the distribution was irregular, with almost the average amount at many places, and a slight to moderate deficiency in various districts. At Logie-Coldstone the month (6.24 in.) was the wettest August since 1878; at Grantown-on-Spey the "record" of August 1923 was exceeded by about half an inch; but at Dumfries a total of 3.67 in., compared with as much as 8.42 in. for August 1923.

For the fourth month in succession thunderstorms were frequent, though less so than in July. Except in Orkney and Shetland, the month was very cloudy, especially during the last two weeks or so. At Edinburgh and elsewhere less sunshine was recorded than in any month since February.

SEPTEMBER.

There was again a singular absence of really warm days, and even during fine and fairly warm weather experienced early in the month few places reached 70°. During the second and third weeks temperature was only moderate, and towards the end of the month distinctly low. The extremes for the month were in no way remarkable, and the temperature deficiency was due mainly to cold days.

As regards rainfall, the three outstanding episodes of the month were (1) very heavy rains towards the north on 8th; (2) large falls during comparatively short periods in eastern districts on 23rd; and (3) heavy falls very generally on 28th

and 29th. Thus, on 8th, a very large area appears to have had as much as 2 in. within twenty-four hours (*e.g.*, 2.20 in. at Tongue and 2.32 in. at Keith), and there was heavy flooding in the Moray Firth area; and on 23rd thunderstorm rains gave as much as 2 in. at Aberdeen and for some distance up the Dee valley. There was a decided excess in practically all districts, with fully twice the normal in the extreme south-west and in many parts of the Moray Firth area and the extreme north.

Flooding occurred in the south of Scotland on 8th, and very serious flooding in the north on 9th.

Thunderstorms were fairly numerous for September, and considerable areas were affected on the evening of 17th and afternoon of 23rd. Sunshine aggregates were above the normal, and much above those for August.

OCTOBER.

There was an early recovery from the cold which had characterised the last few days of September, and an alternation of mild and colder periods throughout the month. The nights were relatively mild, and in most districts frost was unimportant. The mean temperature of the month was in general above the normal, slightly so in most districts, but decidedly in the extreme north.

On 5th continuous rain set in in east and north, but nowhere spread with any great intensity beyond a line running, roughly, down the centre of Scotland. An extensive area in east and north had more than 1 in., whilst amounts of more than 2 in. were recorded around the upper reaches of the Moray Firth, in parts of Banffshire and Kincardineshire, and at, *e.g.*, Arbroath, Dundee, and Dunbar. A feature of this rainstorm appears to have been the very uniform rate at which the rain fell; but as regards amount, nowhere was anything approaching a "record" reported. Thus Nairn had 2.09 in., but 3.78 in. on 25th September 1915; and Dundee 2.12 in., but 3.36 in. on 7th July 1916. On 6th the rain area had spread to the west, but amounts were moderate; whilst from 12th onwards the only rains of much importance occurred on 18th and 19th and during the last few days. On 26th rain began to spread from the south-east to nearly all districts. Considerable areas in the west had only three-quarters or less of the normal, and areas of well-defined excess hardly extended beyond the Moray Firth region, Forfarshire, eastern Fife, and the Lothians.

Fog was rather frequent, especially about the middle of the month, and then notably in the Firths of Forth and Tay; but in spite of some very dull weather, with general sunshine

from 6th to 13th, and on 17th, 24th, and one or two other days, sunshine aggregates here and there exceeded the normal.

A thunderstorm occurred in parts of Dumfriesshire on 6th.

NOVEMBER.

As regards temperature, the month ranks as a decidedly mild one, and only about 3rd, 16th, and 28th were winds from a northerly point in evidence. For the rest, a southerly to south-westerly air current was dominant, and the general level of the thermometer was high or fairly so, with the temperature excess more pronounced by night than by day. Whilst taken as a whole the month was less remarkable than November 1920, it may be noted that the concluding week was very unusually mild, and temperature considerably higher than at the corresponding period of the year in 1920.

The month opened with moderate to heavy rains; but from 3rd to 20th, except for a trifling fall on 11th, no rain was recorded at Edinburgh, and in eastern districts especially that period was generally fine. On 17th unsettled conditions began to affect north-western districts, gradually spreading and reaching all areas by 21st. From 21st to 23rd there were some rather heavy falls, and at Greenock half the month's total was accounted for by those three days. Here and there in extreme west and south-west aggregates just reached the normal; but nowhere was there even a trifling excess, and over a large part of Scotland the deficiency was decided.

Fog was again rather frequent, and wind force was high at times, with a gale rather widely on 21st. After a passing touch of winter on 2nd and 3rd there was nowhere any snow.

Sunshine was rather fitful, but a few exceptionally sunny days brought aggregates up to the normal in many districts. At Aberdeen, however, which had only half the sunshine enjoyed at Edinburgh, the month was the cloudiest November on record.

A thunderstorm occurred at some points in Argyllshire on the evening of 1st.

DECEMBER.

Temperature was moderately low for two or three days about the middle and again at the end of the month; but, judged by its mean temperature, the month was certainly much the mildest December experienced in Scotland since 1857. During the second week an incursion of cold air affected eastern and south-eastern England, and the mean temperature of that week at Balmoral and Eskdalemuir was several

degrees above that of London, and appreciably above that of Jersey.

An interesting feature of the month's rainfall was an exceptional area of deficiency in the low-lying regions of Banff, Moray, and East Lothian. Thus Gordon Castle had less than 1 in., hardly more than one-third of the normal, and the lowest December rainfall since 1905. Elsewhere there was an excess of varying amount: at Dumfries, for example, the total was nearly twice the normal. A succession of heavy rainstorms, widely on 22nd, in some districts on 25th, and very widely from 26th to 29th, was remarkable, with numerous falls of 2 in. or more within twenty-four hours—*e.g.*, 2·21 in. at Greenock on 26th. Earlier in the month moderate to fairly heavy falls had been general from 5th to 8th; and around 12th, and again on 17th and 18th, very heavy rains had been experienced in central and north-western districts. On 12th, Kinlochquoich, in the West Highlands, had as much as 4·70 in., or exactly five times the rainfall recorded at Gordon Castle during the entire month.

Very violent gales were experienced at times, and extensive flooding occurred towards the north at the end of the month.

Thunderstorms were of almost daily occurrence from 21st onwards, chiefly towards the north-west. At Edinburgh the month ranks as a very sunny one for mid-winter, with an average of two hours per day, as compared with little more than one hour per day at Aberdeen.

General Note.

The most notable features of the year were perhaps the frequency of thunderstorms during the summer months, the heavy rains in the north-east of Scotland during August, and the mild and stormy character of the weather experienced during the latter part of November and the whole of December. The rainfall of the year did not differ greatly from the average, though in the east and north-east there was an appreciable excess. Amounts were, as a rule, much less than those recorded in 1923.

RAINFALL RECORDS FOR 1924, IN INCHES.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Year.
Shetland—Lerwick . . .	4.14	2.99	3.32	5.41	3.32	2.23	4.00	1.75	4.07	3.05	2.70	7.75	45.68
Orkney—Deerness . . .	3.04	3.39	1.56	1.81	1.96	1.72	2.56	3.12	5.08	3.35	2.62	2.26	32.43
Caithness—Wick . . .	1.95	2.25	1.57	1.08	2.30	1.44	3.85	2.30	4.06	2.35	1.49	1.48	26.07
Sutherland—Tongue . . .	2.49	3.21	2.37	2.51	3.13	3.53	3.72	5.37	6.32	2.78	2.00	3.38	40.26
Laig . . .	2.27	3.93	1.75	1.91	2.20	2.43	3.27	5.42	4.44	3.36	1.89	2.36	35.81
Ross and Cromarty—													
Portree . . .	1.38	1.65	.96	.58	3.27	2.13	3.92	3.36	2.33	3.16	.89	2.47	34.75
Ardross Castle . . .	2.03	2.63	1.35	1.47	5.77	2.16	4.32	4.59	6.20	2.23	2.03	4.45	39.79
Lochcarron . . .	5.49	3.31	1.95	5.07	3.51	6.90	4.37	6.64	7.54	5.56	4.41	11.07	71.33
Stornoway . . .	4.56	3.04	4.41	2.87	3.06	3.33	4.34	4.74	5.25	4.97	4.14	9.34	54.45
Inverness—													
Kingussie . . .	1.36	1.75	.52	1.23	3.15	1.33	3.69	4.13	4.09	1.96	1.50	4.33	30.59
Glenquoich . . .	10.47	3.35	1.00	4.54	6.14	7.74	10.22	7.01	14.39	7.46	8.35	22.77	103.92
Fort-William . . .	3.33	2.32	.53	3.26	3.36	4.94	3.58	6.33	3.98	5.42	6.08	15.13	74.81
Portree . . .	5.91	3.16	1.97	4.24	3.29	5.61	6.09	5.95	7.57	6.66	7.20	13.29	71.14
Nairn—Nairn (Dalmie)	1.63	1.26	.71	.50	2.56	2.22	3.43	4.37	3.39	3.43	.88	2.37	27.60
Moray—Gordon Castle . . .	1.35	1.37	1.31	.33	3.51	3.35	3.20	5.05	4.38	3.43	1.31	.94	29.48
Grantown . . .	1.14	3.08	.33	.47	3.27	2.29	4.39	6.15	3.99	3.16	1.30	1.90	31.77
Aberdeen—Fyvie Castle . . .	2.30	2.60	3.21	.90	3.11	1.41	3.05	5.95	4.35	2.91	2.30	1.74	36.53
Peterhead . . .	2.02	1.73	1.32	1.36	4.52	1.90	4.17	3.96	4.31	3.39	2.46	2.13	33.45
Aberdeen (King's Coll.) . . .	2.09	1.59	1.09	1.63	4.35	1.76	5.38	2.24	4.42	2.96	2.56	3.16	33.73
Balmoral . . .	1.49	1.99	.94	1.43	3.31	1.35	4.03	4.24	4.51	3.12	1.99	4.33	33.30
Kincardine—													
Balmakewan . . .	3.42	1.54	.61	1.35	3.30	1.30	4.77	2.55	4.02	4.76	2.46	3.74	34.92
Forfar—Monkrose . . .	3.59	1.03	.03	2.13	3.13	1.23	4.37	3.02	4.53	4.55	1.76	2.79	31.96
Dundee (E. Necropolis)	2.60	1.69	.73	1.33	4.40	2.17	4.74	2.33	4.53	4.72	3.00	4.02	55.66
Forfar . . .	2.73	1.37	.69	1.50	4.23	1.62	4.50	3.07	3.53	4.65	2.65	4.42	34.96
Lintrathen . . .	2.90	1.44	.57	1.37	4.03	1.59	5.43	3.92	3.80	4.19	3.01	5.75	38.30
Perth—Blair Castle . . .	2.67	1.33	.56	1.76	2.93	1.73	4.73	4.73	4.72	4.23	2.37	3.36	33.19
Grief . . .	3.39	.91	.91	2.34	6.16	1.76	4.67	4.35	4.90	3.37	2.43	3.33	45.07
Perth . . .	2.33	.36	.76	1.46	5.73	2.29	5.06	3.53	3.64	3.62	1.31	4.74	36.47
Killin . . .	4.71	1.60	.30	3.37	5.00	3.21	6.31	3.32	7.37	5.24	5.40	14.22	60.43
Aberfoyle . . .	6.30	1.70	1.00	3.30	5.70	2.60	5.10	4.75	6.70	5.00	4.75	11.20	53.50
Fife—Cupar . . .	2.31	.35	.62	1.03	3.30	1.33	4.72	2.40	3.51	3.06	1.31	3.71	29.33
Kinross—Loch Leven . . .	3.16	1.17	1.04	1.65	4.73	1.31	5.73	3.06	4.03	3.34	2.57	5.01	37.40
Clackmannan—													
Tillicoultry . . .	3.73	1.07	.75	2.16	4.03	2.09	4.59	4.00	3.47	3.30	2.91	5.34	39.32
Argyll—Gruline (Mull)	3.88	4.12	.39	5.72	4.33	4.55	6.34	6.75	3.13	3.32	7.33	12.93	77.17
Oban . . .	5.32	1.39	.55	3.10	3.30	3.35	6.20	5.43	7.44	4.44	5.49	9.22	53.33
Glenorchy Manse . . .	3.03	4.31	.53	4.32	3.30	5.43	3.35	6.30	4.39	5.99	6.39	13.72	73.01
Ardrahaig . . .	6.07	2.65	.39	4.11	4.53	4.91	7.13	7.00	6.30	5.15	5.79	7.60	62.33
Campbeltown . . .	5.79	1.64	1.26	3.73	5.53	2.41	4.02	4.79	6.33	4.43	5.16	6.10	51.39
Bute—Rothesay . . .	5.91	1.47	1.16	3.31	4.37	3.03	5.96	5.16	5.63	3.91	3.52	7.33	51.37
Stirling—Stirling . . .	4.24	.45	.94	2.51	4.03	2.23	3.35	2.44	3.30	3.14	2.33	3.11	39.35
Dumbarton—													
Arrochar . . .	10.41	4.33	.95	6.42	6.74	5.79	10.11	6.75	10.32	6.30	9.20	14.13	92.95
Helensburgh . . .	6.33	1.59	1.66	2.76	5.01	3.35	5.13	4.25	5.99	4.30	4.90	7.99	53.31
Renfrew—Greenock . . .	7.36	1.16	1.67	3.42	5.12	3.27	4.13	3.30	7.41	4.07	3.31	11.23	58.03
Paisley . . .	5.31	.73	1.00	2.59	4.31	3.05	3.20	3.23	4.34	3.26	3.53	7.76	42.36
Ayr—													
Kilmarnock (Agric. Coll.) . . .	5.19	.94	.73	2.25	4.34	2.73	3.56	4.13	5.33	3.24	2.33	4.37	40.39
Ayr . . .	4.66	.77	1.20	2.19	3.73	2.27	2.33	3.39	6.33	3.07	2.37	4.53	33.19
Pinmore . . .	6.24	1.45	.96	5.45	3.45	3.30	3.51	4.34	6.33	3.24	4.27	6.31	49.20
Muirkirk . . .	3.33	1.99	.32	2.23	4.22	1.00	4.03	4.56	5.61	3.45	3.30	5.21	41.30
Lanark—													
Biggar . . .	2.33	.69	.57	1.52	3.25	1.24	4.43	3.97	3.37	2.39	1.77	4.32	30.40
Carmunnock . . .	4.46	.69	.99	2.33	4.35	2.11	3.46	3.03	5.39	3.20	3.50	7.10	41.31
Leadhills . . .	9.75	1.70	1.12	5.43	5.51	2.32	6.34	3.36	3.11	5.91	5.41	11.47	72.33
Linthgow—Linthgow . . .	2.93	.34	1.30	1.33	6.51	3.27	3.91	2.93	3.91	3.20	2.16	5.91	33.77
Mid-Lothian—													
Glencorse . . .	3.14	.79	1.01	1.39	5.33	2.55	4.35	3.37	3.55	3.33	1.31	3.34	34.21
Edinburgh (University)	1.37	.75	1.43	1.30	4.22	1.50	4.25	2.27	2.73	3.06	.97	3.36	27.76
Haddington—													
North Berwick . . .	1.37	.73	.63	.75	4.46	1.30	4.00	2.55	4.07	3.73	1.50	1.63	27.30
Stobahills Reservoir . . .	1.34	.30	.47	.32	3.34	2.35	4.10	4.07	3.33	2.30	4.40	3.34	33.10
Berwick—Marchmont . . .	2.49	1.36	.90	1.24	5.44	2.33	5.73	3.31	3.73	3.33	1.57	3.33	33.44
Coldstream, The Hiresel . . .	1.37	.66	.54	.36	4.52	2.11	4.31	3.20	2.34	2.33	.79	1.35	25.13
Peebles—Castlecraig . . .	3.02	1.37	.30	1.32	3.44	1.55	4.44	3.27	3.30	3.20	2.21	4.43	33.46
Selkirk—Fairlie . . .	2.36	1.14	.76	1.36	3.30	1.36	4.72	2.13	3.13	2.73	1.91	4.33	30.73
Roxburgh—													
Branchholme . . .	3.40	.97	.95	3.03	4.22	1.03	3.13	3.11	4.55	4.00	1.32	7.71	35.77
Kelso (Broomlands) . . .	1.47	.73	.64	.32	3.76	2.35	4.10	3.34	2.17	3.55	.74	2.31	24.77
Dumfries—Dumfries . . .	4.42	.24	1.21	3.35	3.39	1.43	3.75	3.37	4.42	3.23	2.34	7.39	33.39
Drumlanrig . . .	3.55	.35	1.40	3.00	4.43	1.44	5.40	4.41	5.33	4.74	3.39	3.33	49.33
Castle Milk . . .	4.31	.62	1.33	3.27	5.05	2.00	4.33	5.19	4.90	4.25	3.34	7.79	47.33
Langholm . . .	6.23	1.30	1.33	3.13	3.39	3.33	5.42	4.49	5.71	4.70	4.33	9.71	55.37
Kirkcudbright—													
Gargan . . .	5.31	.61	1.31	3.33	4.33	1.73	4.33	4.37	5.30	3.39	2.92	9.42	43.30
Dalbeattie (Kirkcannan)	6.02	.54	1.10	3.16	3.32	2.09	4.33	5.41	6.33	4.43	3.33	3.30	50.33
Carstairs (Shiel) . . .	10.73	2.33	1.63	3.33	4.33	3.13	6.33	6.33	10.33	4.43	4.73	12.34	73.33
Wigtown—Monreith . . .	5.49	.93	1.33	1.30	3.31	2.34	4.31	4.02	6.02	2.39	2.37	4.73	40.36

AGRICULTURAL STATISTICS.—RETURNED UPON 4TH JUNE 1924.—(Compiled from the Government Returns).

TABLE No. 1.—AVERAGE UNDER CROPS AND GRASS IN EACH COUNTY OF SCOTLAND.

[illegible]

TABLE NO. 3.—TOTAL PRODUCE OF BEANS AND POTATOES, AVERAGE AND YIELD PER ACRE in the Year 1923, compared with the YIELD for the Years 1922 and 1921, and the AVERAGE of the Ten Years, 1913-1922, in each COUNTY of SCOTLAND.

COUNTY.	BEANS.										POTATOES.									
	Total Produce in 1923.					Yield per acre.					Average of the Ten Years 1913-1922.					Total Produce in 1923.				
	Qrs.	Acre.	Bush.	1922.	1921.	Bush.	1922.	1921.	Bush.	Acre.	Tons.	1923.	1922.	1921.	Tons.	Tons.	1923.	1922.	1921.	Average of the Ten Years 1913-1922.
Aberdeen	80	23	10.4	6.2	10.5	17.8	5.4	6.6	8.2	40,000	7,855	5.4	6.6	8.2	6.9	6.9	5.4	6.6	8.2	6.9
Argyll	130	27	33.9	33.4	34.2	28.4	37.7	38.0	38.0	12,000	3,123	3.7	5.0	6.0	6.7	6.7	3.7	5.0	6.0	6.7
Ayr	1,100	280	30.9	35.8	39.4	36.7	39.4	39.4	39.4	56,000	8,465	6.6	9.6	7.2	8.6	8.6	6.6	9.6	7.2	8.6
Baird	600	81	12.8	27.6	27.6	27.9	27.6	27.6	27.6	9,100	1,754	5.2	6.1	5.8	6.0	6.0	5.2	6.1	5.8	6.0
Barrick	600	181	23.4	29.8	22.5	30.7	22.5	22.5	22.5	14,000	2,470	5.6	7.1	6.6	6.3	6.3	5.6	7.1	6.6	6.3
Bute	80	19	33.9	31.8	33.9	28.1	33.9	33.9	33.9	2,700	1,075	5.2	7.3	6.3	6.6	6.6	5.2	7.3	6.3	6.6
Cathness	1,460	270	40.8	39.7	41.8	45.2	39.7	41.8	41.8	2,800	381	7.3	7.8	6.5	6.9	6.9	7.3	7.8	6.5	6.9
Dumfriesshire	20	13	23.4	27.8	31.4	30.7	27.8	31.4	31.4	14,000	2,282	6.3	8.1	7.5	7.5	7.5	6.3	8.1	7.5	7.5
Dumfries	350	88	32.5	36.2	33.4	37.8	36.2	33.4	33.4	21,000	3,534	5.9	8.6	7.3	7.2	7.2	5.9	8.6	7.3	7.2
High Lochian	1,700	354	39.7	38.0	32.7	38.1	38.0	32.7	32.7	113,000	15,901	7.4	7.8	7.0	6.9	6.9	7.4	7.8	7.0	6.9
High	220	52	33.7	40.0	30.0	37.0	40.0	30.0	30.0	117,000	16,610	7.0	7.4	6.4	6.5	6.5	7.0	7.4	6.4	6.5
Inverness	5	2	20.0	27.8	33.0	30.2	27.8	33.0	33.0	8,600	5,218	1.6	4.1	2.6	2.7	2.7	1.6	4.1	2.6	2.7
Kinross	110	29	30.2	36.0	36.0	33.9	36.0	36.0	36.0	8,400	1,179	7.1	8.1	6.7	6.7	6.7	7.1	8.1	6.7	6.7
Kirkcubright	20	5	31.0	34.0	36.4	35.1	34.0	36.4	36.4	6,600	1,876	4.7	8.2	7.3	6.7	6.7	4.7	8.2	7.3	6.7
Leithgow	240	55	35.2	38.0	31.3	30.9	38.0	31.3	31.3	26,000	5,279	4.9	10.0	10.0	8.8	8.8	4.9	10.0	10.0	8.8
Mid-Lothian	40	15	22.0	24.6	38.4	35.3	24.6	38.4	38.4	17,000	2,381	7.3	8.0	7.2	7.2	7.2	7.3	8.0	7.2	7.2
Mid-Lothian	40	15	22.0	24.6	38.4	35.3	24.6	38.4	38.4	45,000	6,333	7.3	8.1	6.6	6.6	6.6	7.3	8.1	6.6	6.6
Murray	40	15	22.0	24.6	38.4	35.3	24.6	38.4	38.4	7,900	1,502	5.3	6.0	6.3	5.9	5.9	5.3	6.0	6.3	5.9
Nairn	40	15	22.0	24.6	38.4	35.3	24.6	38.4	38.4	1,100	283	3.9	5.6	5.0	4.9	4.9	3.9	5.6	5.0	4.9
Orkney	40	15	22.0	24.6	38.4	35.3	24.6	38.4	38.4	8,800	2,271	1.7	3.8	4.8	4.9	4.9	1.7	3.8	4.8	4.9
Perth	2,400	769	25.4	27.7	30.3	35.5	27.7	30.3	30.3	1,800	314	5.6	6.6	6.8	6.7	6.7	5.6	6.6	6.8	6.7
Perth	2,400	769	25.4	27.7	30.3	35.5	27.7	30.3	30.3	117,000	16,071	7.8	7.6	6.8	6.5	6.5	7.8	7.6	6.8	6.5
Rothes and Cromarty	840	65	42.0	40.0	41.3	41.1	40.0	41.3	41.3	23,000	2,928	7.8	8.2	9.3	7.9	7.9	7.8	8.2	9.3	7.9
Salisbury	380	93	28.3	23.9	26.3	29.3	23.9	26.3	26.3	17,000	6,889	2.5	6.6	4.5	5.0	5.0	2.5	6.6	4.5	5.0
Salisbury	380	93	28.3	23.9	26.3	29.3	23.9	26.3	26.3	6,900	1,112	6.3	7.6	6.9	6.3	6.3	6.3	7.6	6.9	6.3
Shetland	5,000	1,381	28.9	34.4	32.0	40.6	34.4	32.0	32.0	16,000	2,167	4.7	6.0	4.6	5.1	5.1	4.7	6.0	4.6	5.1
Shetland	5,000	1,381	28.9	34.4	32.0	40.6	34.4	32.0	32.0	19,000	2,865	6.5	7.6	8.0	7.3	7.3	6.5	7.6	8.0	7.3
Wigtown	170	54	25.5	29.5	29.6	34.2	29.5	29.6	29.6	6,500	1,193	5.5	4.9	5.3	5.0	5.0	5.5	4.9	5.3	5.0
Wigtown	170	54	25.5	29.5	29.6	34.2	29.5	29.6	29.6	7,700	1,561	4.9	7.8	5.6	6.7	6.7	4.9	7.8	5.6	6.7
Total	14,400	3,803	30.3	34.6	31.7	36.7	34.6	31.7	31.7	821,000	136,976	6.0	7.6	6.8	6.6	6.6	6.0	7.6	6.8	6.6

* Average of 9 years only.

† Average of 8 years only.

‡ Average of 6 years only.

§ Average of 7 years only.

TABLE No. 4.—TOTAL PRODUCE OF TURNIPS (including SWEDS) and MANOKLA, AVERAGE and YIELD per Acre in the Year 1923, compared with the YIELD for the Years 1922 and 1921, and the AVERAGE of the Ten Years, 1913-1922, in each COUNTY of SCOTLAND.

COUNTIES.	TURNIPS AND SWEDS.					MANOKLA.				
	Total Produce in 1923.	Acreage in 1923.	Yield per Acre.			Total Produce in 1923.	Acreage in 1923.	Yield per Acre.		
			1923.	1922.	1921.			1923.	1922.	1921.
	Tons.	Acres.	Tons.	Tons.	Tons.	Tons.	Acres.	Tons.	Tons.	Tons.
Aberdeen	1,500,000	82,273	14.6	16.2	17.1	80	8	9.7	8.4	19.5
Argyll	65,000	5,281	12.3	14.9	16.5	100	13	7.5	11.1	14.0
Ayr	132,000	7,674	16.9	18.6	21.8	836	386	15.6	18.2	22.6
Banff	297,000	20,171	14.7	17.1	17.4	16.5	16.5	16.6	18.2	21.4
Barrick	454,000	21,469	21.1	20.9	18.8	18.3	168	19.6	17.0	13.3
Bute	19,000	1,370	14.1	16.0	18.3	16.5	16.5	13.0	16.4	16.3
Caithness	177,000	11,619	15.3	20.5	22.0	90	7	18.0	16.4	15.8
Chickman	16,000	797	19.8	18.6	16.6	15.9	17.8	..	..	11.4
Dumfriesshire	276,000	1,486	18.3	18.6	22.5	350	18	19.3	20.1	21.8
Dumfries	206,000	15,651	17.6	17.6	19.6	17.3	170	14.9	15.4	19.7
East Lothian	370,000	12,680	16.3	21.1	18.7	17.8	841	17.9	19.3	19.6
Fife	310,000	21,719	17.0	19.1	17.1	17.9	43	14.2	16.5	14.3
Forfar	615,000	81,109	19.8	18.6	18.5	19.0	19	16.4	15.7	18.8
Inverness	101,000	9,290	10.9	14.7	14.6	14.2	19	..	16.4	15.0
Kinross	284,000	15,569	18.3	16.8	15.4	14.7	..	..	..	12.2
Kirkcubright	44,000	2,449	18.0	18.9	16.6	17.1	..	..	..	..
Leamington	141,000	9,999	14.1	14.8	18.3	16.2	1,000	12.9	16.5	18.7
Leithgow	320,000	9,808	19.0	20.5	20.2	19.9	80	12.0	12.8	9.2
Mid-Lothian	166,000	9,727	18.3	21.6	20.4	18.9	320	24.2	22.9	24.6
Moray	224,000	13,892	16.1	16.4	16.2	17.3	64	16.3	23.1	21.3
Nairn	46,000	3,855	11.8	16.4	16.7	16.5	6	17.5	17.5	16.8
Orkney	50,000	15,692	3.7	10.3	9.8	14.1	..	..	15.0	12.9
Perth	55,000	3,038	18.1	18.5	17.7	9.9	..	..	..	..
Perthshire	497,000	25,376	19.6	16.4	18.9	18.3	1	15.0	20.0	..
Renfrew	57,000	2,125	26.6	16.5	18.8	17.0	300	9.9	15.2	18.0
Rose and Cromarty	199,000	14,197	14.0	16.4	17.9	18.2	80	24.5	17.3	18.3
Shetland	289,000	17,438	16.6	17.4	14.1	16.1	130	13.8	17.9	19.4
Shetland	38,000	2,050	18.8	15.7	16.9	14.5	35	10.1	13.1	16.6
Shetland	12,000	983	12.3	12.0	10.5	15.6	..	..	18.0	17.2
Shetland	69,000	3,919	17.6	21.6	22.3	11.7	..	..	15.3	..
Shetland	40,000	2,834	14.1	10.8	10.3	25.0	2	16.5	16.2	24.0
Wigtown	157,000	12,853	12.2	16.4	16.0	13.9	266	11.2	16.2	23.5
Total	6,861,000	409,642	16.0	17.0	17.4	16.6	1,681	15.4	17.2	20.0

* Average of 6 years only.

† Average of 7 years only.

‡ Average of 9 years only.

§ Crop failed.

* Average of 6 years only.

† Average of 7 years only.

‡ Average of 9 years only.

§ Crop failed.

TABLE NO. 6.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS IN EACH COUNTY OF SCOTLAND AS RETURNED ON JUNE 4, 1924.

Counties.	Horses (including Ponies).				CATTLE.				SHEEP.				Pigs.					
	Used solely for Agriculture, &c.	Unbroken Horses.		Other Horses.	Cows in Milk.	Cows in Calf, but not in Milk.	Heifers in Calf.	Bulls used for Service.	Other Cattle.		Ewes kept for Breeding.	Rams to be used for Service.		1 Year Old and above.	Under 1 Year.			
		1 Year & Under.	Above 1 Year.						2 Years & above.	1 Year & Under.								
1. Aberdeen	21,005	9,905	1,079	2,827	36,836	3,169	2,048	1,703	39,201	47,367	34,310	37,339	2,538	23,164	104,593	2,501	19,608	
2. Argyll	4,245	18	950	1,632	17,015	2,405	1,780	941	9,185	10,718	11,769	363,733	10,747	124,450	246,063	1,108	4,799	
3. Argyll	6,936	40	1,521	338	45,415	6,734	9,149	2,420	9,836	17,484	19,355	162,405	4,431	49,317	146,786	1,608	171	
4. Banff	6,247	12	1,187	264	10,671	1,068	506	487	5,926	12,438	10,548	24,971	810	38,716	98,716	481	3,941	
5. Berwick	3,741	11	555	103	629	2,853	544	298	6,987	6,901	9,880	127,688	3,128	89,889	175,981	784	101	
6. Bute	901	4	340	33	132	352	303	177	1,586	1,906	2,087	18,858	6,310	6,319	14,855	83	14	
7. Caithness	4,163	14	716	183	458	6,024	700	289	166	2,159	5,307	64,108	1,610	18,175	65,234	284	32	
8. Clackmannan	1,473	8	176	36	47	1,023	166	116	65	1,121	698	458	5,624	1,281	5,564	159	17	
9. Dumfriesshire	1,276	12	809	91	231	5,250	1,149	785	1,754	1,788	1,752	31,416	1,002	9,586	24,416	150	21	
10. Dumfries	6,068	12	1,489	906	1,170	16,784	2,248	6,588	1,000	9,816	14,586	246,109	6,746	62,004	284,881	1,497	143	
11. East Lothian	2,803	1	320	46	234	2,107	338	403	4,958	2,852	1,436	48,933	1,687	20,896	63,380	773	89	
12. Fife	6,938	15	1,825	263	1,118	9,427	1,890	1,381	12,941	10,607	6,973	40,742	1,468	11,932	55,688	1,570	302	
13. Forfar	7,540	9	855	179	920	9,860	1,059	632	16,664	10,417	5,694	71,195	5,679	22,708	80,241	1,117	143	
14. Inverness	6,266	48	1,010	450	582	16,495	2,305	1,052	4,756	8,251	11,687	236,359	6,738	86,146	177,264	274	47	
15. Kinross	3,729	3	516	104	493	6,483	444	385	6,780	7,346	4,939	22,605	5,599	4,501	26,339	556	60	
16. Kirkcubright	808	2	233	59	108	1,271	167	188	86	1,244	2,176	1,029	478	8,843	14,358	94	13	
17. Kirkcubright	3,516	38	1,046	231	701	17,182	1,061	5,210	9,777	9,450	12,362	9,771	168,367	5,209	50,311	154,310	1,518	174
18. Leask	5,851	63	1,869	294	1,075	23,439	6,042	6,277	1,545	8,856	10,370	102,768	8,399	32,082	95,660	1,046	110	
19. Lethbridge	1,553	10	408	130	283	4,211	798	710	246	2,252	1,666	1,494	1,671	4,272	8,131	393	89	
20. Mid Lothian	2,991	10	440	99	532	7,914	761	674	317	3,239	2,806	1,713	68,355	27,694	76,669	1,814	502	
21. Moray	8,460	7	715	145	408	5,429	518	358	244	3,945	6,376	4,976	517	7,679	20,219	439	40	
22. Nairn	916	2	271	52	206	1,851	140	118	566	1,735	1,847	5,847	324	8,037	15,102	131	19	
23. Orkney	5,031	10	667	155	805	8,312	1,105	572	322	8,677	8,864	7,905	19,943	4,326	15,096	319	25	
24. Perth	765	7	155	40	129	1,701	233	438	135	2,059	1,784	1,899	91,901	9,177	19,720	87,331	69	8
25. Perth	9,187	42	1,769	855	1,974	18,795	14,08	878	14,846	18,099	13,131	265,332	8,069	5,967	16,419	151,811	294	10,683
26. Dundee	2,052	17	119	115	388	11,412	2,944	684	2,064	8,036	5,265	7,104	2,628	56,140	99,942	593	70	
27. Ross & Cromarty	6,857	15	797	171	645	13,714	1,804	1,181	5,210	8,265	8,265	216,576	5,638	71,989	255,016	593	64	
28. Shetland	8,171	6	436	86	772	1,466	309	329	6,598	6,042	8,946	216,576	5,638	71,989	255,016	593	64	
29. Shetland	494	1	74	10	95	1,093	85	190	57	1,314	946	854	1,772	20,198	80,773	185	14	
30. Shetland	484	4	283	167	2,117	4,673	788	294	86	1,578	2,045	48,205	2,493	24,232	45,968	9	3	
31. Shetland	1,956	48	909	243	544	8,046	1,834	681	7,461	6,684	4,442	54,631	1,455	13,628	46,769	426	61	
32. Shetland	1,114	89	209	53	178	5,212	685	355	747	2,078	1,852	86,691	2,188	43,878	70,913	60	14	
33. Shetland	1,839	2	1,319	353	650	24,770	1,110	8,110	1,039	8,119	8,570	52,595	1,612	13,686	56,973	1,436	152	
Total	137,980	598	26,917	6,392	32,529	352,256	46,439	49,693	17,879	248,440	290,394	2,892,118	89,876	987,367	2,892,896	34,014	2,721	

* Including Mares kept for breeding.

† Above two years old used, or intended to be used, for service.

TABLE No. 7.—QUANTITY AND VALUE OF CORN, &c., imported into the United Kingdom in the undermentioned Years.

[From Trade and Navigation Returns.]

	Quantities.			Values.		
	1922.	1923.	1924.	1922.	1923.	1924.
Wheat from—	Owt.	Owt.	Owt.	£	£	£
United States	37,261,900	31,461,744	31,038,037	22,489,828	16,846,669	18,665,806
Argentine Republic	18,804,200	21,026,044	24,088,960	11,626,921	11,004,827	13,209,114
British East Indies	487,600	12,522,810	9,839,191	297,259	6,739,594	6,117,759
Australia	16,334,997	4,654,230	10,871,055	10,265,586	2,597,088	6,361,291
Canada	22,909,800	28,486,785	38,866,251	13,789,784	15,199,549	23,386,477
Other countries	581,137	2,315,820	3,622,019	824,845	1,180,146	1,972,692
Total	96,879,684	100,466,923	118,275,513	58,794,133	53,567,868	69,603,138
Wheat, meal, and flour, from—						
France	198,000	108,353	59,421	146,991	64,464	46,270
United States	4,576,701	3,838,716	3,610,500	3,662,967	2,755,657	2,835,273
Argentine Republic	290,300	205,160	309,895	146,192	124,678	162,981
Australia	1,771,880	1,785,369	1,629,906	1,378,076	1,215,869	1,166,157
Canada	6,596,440	5,580,511	5,249,477	5,311,709	3,980,466	4,006,546
Other countries	46,450	140,356	198,873	26,795	66,882	118,671
Total	13,474,721	11,718,465	11,057,072	10,671,730	8,207,956	8,333,898
Barley	12,703,275	18,120,280	21,745,151	6,073,516	7,880,004	12,149,920
Oats	9,356,902	9,759,055	10,491,343	4,365,601	4,148,239	4,414,131
Peas	1,314,508	1,976,956	1,783,268	1,699,088	1,849,149	
Beans, not fresh	1,134,270	1,393,079	1,624,358	646,466	677,929	991,096
Maize	37,200,102	34,489,643	37,781,610	15,021,805	14,251,849	17,060,393
Maize products	2,189,855	1,525,283	1,735,164	981,865	688,297	920,644
Oat products	855,052	853,293	906,646	906,446	808,187	909,142
Rice—						
From Brit. East Indies	1,284,706	1,384,232	1,913,834	357,214	378,952	1,346,166
From other countries	1,460,703	1,824,114	1,378,812	1,427,768	1,520,956	1,446,655
Other kinds of grain	665,377	985,780	997,955	396,687	451,818	482,614
Other products	318,838	420,015	566,666	592,885	716,239	855,169
Malt	3,861	26,126	84,888	9,677	26,508	28,488
Farinaceous substances	1,126,942	1,047,269	1,363,705	939,750	1,031,751	1,554,049
Total of corn, &c.	69,599,391	73,880,784	82,828,400	38,865,606	34,893,089	41,968,417

TABLE No. 8.—RETURN OF THE AVERAGE PRICES OF WOOL in the Years 1923 and 1924.

Years.	Australian.	South African.	English Fleeces.
	Per lb.	Per lb.	Per lb.
	s. d.	s. d.	s. d.
1923	1 6½	1 2½	1 2½ to 2 1½
1924	2 8½	1 6½	1 10 to 2 9½

TABLE NO. 9.—QUANTITIES AND VALUES OF CORN, MEAT, FOOD PRODUCTS, AND ARTICLES AFFECTING AGRICULTURE, imported into the United Kingdom in the Year 1924, with the Corresponding Figures for 1922 and 1923.

[From Trade and Navigation Returns.]

	Quantities.			Values.		
	1922.	1923.	1924.	1922.	1923.	1924.
ANIMALS, LIVING:—	No.	No.	No.	£	£	£
Cattle	49,557	584,395	1,011,191	1,580,155	11,263,045	19,144,568
Sheep and lambs . . . .	..	372,455	589,107	..	1,068,666	1,764,505
Pigs . . . . .	..	279,003	284,536	..	1,696,930	1,170,160
Total value	49,557	1,235,855	1,834,834	1,580,155	14,028,801	22,079,233
GRAIN, FLOUR, &c. :—	Cwt.	Cwt.	Cwt.	£	£	£
Wheat	96,879,684	100,466,928	118,275,518	58,794,188	58,767,868	69,608,138
Wheat, meal, and flour . .	13,474,731	11,718,465	11,087,072	10,671,780	8,207,956	8,333,898
Barley	12,793,275	18,120,280	21,745,151	6,073,516	7,830,004	12,149,929
Oats	9,856,902	9,759,655	10,491,343	4,368,001	4,148,239	4,414,181
Peas, not fresh	1,314,508	1,976,956	1,783,268	1,699,038	1,848,649	1,603,369
Beans	1,134,270	1,393,979	1,624,358	646,456	677,929	991,096
Maize or Indian corn . .	37,200,102	34,489,643	37,781,610	15,021,805	14,251,849	17,060,343
Maize products	2,189,855	1,525,283	1,735,164	931,865	658,297	920,644
Oat products	835,052	858,293	906,646	906,446	808,187	909,142
All other products . . .	318,838	420,015	566,666	592,885	716,339	856,169
Malt	8,861	23,125	34,868	9,677	26,508	38,488
Rice—						
From British East Indies	1,384,706	1,584,233	1,913,334	867,214	878,952	1,346,166
From other countries . .	1,480,703	1,824,114	1,378,812	1,427,768	1,530,958	1,446,655
Other kinds of grain . .	665,877	985,780	997,955	396,687	451,818	482,614
Farinaceous substances .	1,126,942	1,047,269	1,313,705	939,750	1,031,751	1,354,040
Total value	179,453,746	185,992,012	211,605,985	103,331,521	96,845,199	121,508,732
MEAT:—	Cwt.	Cwt.	Cwt.	£	£	£
Beef, salted	32,854	25,326	10,877	122,303	101,599	80,538
*Beef	10,800,153	12,815,375		24,742,161	27,648,702	
*Mutton	5,848,763	5,864,766	5,101,479	22,341,500	22,773,522	19,731,068
Bacon	5,932,152	7,793,150	7,866,059	25,580,534	38,178,535	37,352,188
Hams	1,433,242	1,747,091	1,636,020	8,585,866	8,358,272	7,670,977
Pork, salted (not bacon or hams)	88,442	72,498	37,665	226,698	175,435	98,179
*Pork	669,164	1,016,599	1,008,887	3,309,738	4,714,472	4,699,412
Tinned, canned extracts, including tongues	1,065,856	1,119,678	1,155,144	5,133,945	4,608,866	4,675,618
All other kinds	342,107	455,808	546,857	1,516,765	1,923,194	2,032,932
*Rabbits (dead)	234,452	253,525	241,182	460,041	653,964	634,750
Total of dead meat . .	28,447,175	31,163,816	17,603,620	101,968,891	109,104,480	104,585,800
DAIRY PRODUCE:—	Cwt.	Cwt.	Cwt.	£	£	£
Butter	4,238,561	5,095,511	5,293,761	37,815,536	44,234,534	49,699,468
Margarine	999,170	1,333,170	1,318,344	8,870,070	4,469,811	4,703,277
Cheese	2,659,845	2,333,546	2,889,459	13,437,818	15,360,707	13,571,548
Total	7,927,076	9,172,227	9,497,564	53,623,424	63,955,052	67,974,293

* Fresh, Chilled, and Frozen.

TABLE No. 9—Continued.

	Quantities.			Values.		
	1922.	1923.	1924.	1922.	1923.	1924.
				£	£	£
POULTRY (alive or dead)	410,284	1,484,809	1,687,458	1,242,175	2,189,410	1,904,483
GAME (alive or dead)	Gt. Hunds.	Gt. Hunds.	Gt. Hunds.	106,268	88,772	..
Eggs	13,661,671	20,045,948	20,817,658	11,801,652	18,819,792	..
Total value . . . . .	..	..	..	12,750,094	16,102,421	..
FRUIT, VEGETABLES, &c.:—	Cwt.	Cwt.	Cwt.	£	£	£
Apples	4,471,839	6,473,897	7,248,626	6,544,109	7,398,331	8,394,092
Cherries	66,455	227,885	242,694	193,752	519,530	494,705
Plums	168,081	880,588	574,477	364,412	1,572,498	..
Pears	997,978	852,426	1,324,064	1,452,370	1,564,897	914,385
Grapes	678,392	708,026	820,312	1,414,928	1,698,445	1,681,858
Oranges	6,982,803	7,626,271	7,519,860	7,366,472	7,056,014	7,108,186
Lemons	869,824	988,535	1,208,688	806,184	889,366	949,812
Unenumerated	392,949	480,146	506,583	590,740	573,346	612,242
Onions	Bushels.	Bushels.	Bushels.	3,882,614	1,969,602	2,102,887
Potatoes	9,583,963	9,897,548	9,517,244	..	..	..
Vegetables, unenumerated (raw)	Cwt.	Cwt.	Cwt.	2,376,367	2,957,948	5,484,466
Hops	3,480,590	4,865,845	3,910,530	1,129,087	1,070,797	1,053,863
Total value	180,860	13,442	95,246	1,557,882	180,511	999,395
OTHER ARTICLES:—	..	..	..	28,179,317	27,871,274	29,745,241
Lard	Tons	Tons.	Tons.	£	£	£
Wool, sheep, and lambs	114,967	121,780	124,551	7,658,758	7,967,729	8,779,140
Wood and timber—	Centals.	Centals.	Centals.	..	..	..
Hewn (pit-props or pit-wood)	11,055,244	7,891,674	7,649,618	58,850,684	46,676,855	70,274,624
Sawn or soft	Loads.	Loads.	Loads.	..	..	..
Staves	2,811,876	3,675,120	3,008,472	5,486,808	7,679,764	5,911,584
Oilseed-cake (not sweetened)	3,999,592	4,678,596	5,189,080	20,949,396	26,651,611	27,468,367
Seeds—	75,021	84,299	126,958	787,687	564,938	1,110,761
Clover and grass	Tons.	Tons.	Tons.	..	..	..
Cotton	327,921	323,015	372,392	3,142,527	2,788,562	3,469,347
Flax or linseed	Cwt.	Cwt.	Cwt.	..	..	..
Rape	313,986	303,663	295,800	1,127,698	926,356	905,509
Soya beans	Tons.	Tons.	Tons.	..	..	..
Bones (whether burnt or not)	433,923	548,284	557,842	4,987,986	5,745,392	6,423,071
Guano	Qrs.	Qrs.	Qrs.	..	..	..
Basic slag	353,649	381,506	447,486	7,011,597	7,548,868	8,825,887
Phosphate of lime and rock } phosphate	33,410	60,897	68,661	578,012	981,894	1,218,708
Nitrate of soda (cubic nitre)	Tons.	Tons.	Tons.	..	..	..
Cotton, raw of 100 lb.	59,357	113,062	128,080	758,934	1,271,993	1,562,052
Hemp	7,302	8,222	9,120	52,858	62,228	68,330
Flax	15,566	15,122	16,122	93,868	99,694	157,268
Hides untanned—	72,093	91,120	67,804	255,054	266,079	177,022
Dry	Tons.	Tons.	Tons.	..	..	..
Wet	371,562	380,151	342,649	1,018,659	613,589	498,879
Petroleum	Cwt.	Cwt.	Cwt.	..	..	..
	917,368	1,452,478	1,644,975	612,101	925,461	1,078,305
	Centals.	Centals.	Centals.	..	..	..
	14,819,398	12,918,776	15,766,562	85,550,189	91,128,745	119,426,175
	Tons.	Tons.	Tons.	..	..	..
	79,503	93,291	108,781	2,748,058	3,257,914	4,417,751
	39,582	33,691	49,869	3,943,711	3,008,349	5,337,401
	Cwt.	Cwt.	Cwt.	..	..	..
	521,054	605,924	646,644	1,956,796	2,325,862	2,608,523
	589,265	791,213	1,158,231	2,241,192	2,355,582	4,055,408
	Gallons.	Gallons.	Gallons.	..	..	..
	995,974,447	990,491,125	1,105,736,483	36,108,260	29,692,139	33,673,428

TABLE No. 10.—QUANTITY AND VALUE OF DEAD MEAT Imported into the United Kingdom in the undermentioned Years.

	Quantities.			Values.		
	1922.	1923.	1924.	1922.	1923.	1924.
BACON, from—	Cwt.	Cwt.	Cwt.	£	£	£
Denmark	2,363,786	2,530,561	3,978,472	16,666,616	19,636,164	30,373,888
United States	2,463,368	2,623,662	1,885,154	12,182,415	11,609,368	7,169,663
* Irish Free State . . . . .	..	308,269	595,046	..	1,661,481	3,156,056
Canada	787,273	834,284	1,106,240	4,821,964	3,846,568	5,480,848
Other countries	867,775	291,874	267,188	2,265,519	1,625,059	1,275,693
Total	5,982,162	7,793,160	7,866,059	35,580,534	38,178,585	37,362,138
BEEF (salted), from—						
United States	23,856	21,007	15,464	114,466	98,704	69,574
Other countries	3,998	4,319	4,413	7,737	7,789	10,964
Total	23,854	25,326	19,877	122,208	101,459	80,538
BEEF (fresh and refrigerated)—						
Denmark	78,663	54,893	18,506	431,841	298,809	96,067
United States	65,756	78,949	79,991	266,938	255,477	284,800
Uruguay	1,146,017	1,184,879	997,409	2,619,099	2,378,422	2,080,934
Argentine Republic	7,608,968	9,686,852	9,985,485	17,679,539	21,213,656	22,301,960
Australia	1,166,590	849,989	750,937	2,204,908	1,613,265	1,490,027
New Zealand	580,335	771,303	564,866	1,174,654	1,391,819	1,056,764
Other countries	153,314	193,899	171,620	871,181	408,173	405,051
Total	10,800,158	12,769,764	12,568,814	24,742,161	27,544,621	27,664,108
HAMS, from—						
United States	1,320,569	1,620,812	1,475,228	7,907,710	7,744,822	6,380,341
Canada	96,870	114,808	145,928	592,018	543,292	692,852
Other countries	16,313	12,471	14,864	85,638	70,958	97,784
Total	1,433,242	1,747,091	1,636,020	8,585,366	8,358,272	7,670,977
TINNED, CANNED EXTRACTS (including Tongues)—						
Beef	921,095	1,019,544	1,041,382	4,547,553	4,319,153	4,302,790
Mutton	52,651	80,891	20,293	258,195	148,768	86,680
„ Other descriptions	92,110	69,248	93,469	328,197	220,945	292,748
Total	1,065,856	1,119,673	1,155,144	5,133,945	4,688,866	4,675,618
ALL OTHER KINDS—						
Tinned or Canned	44,440	15,431	9,323	430,964	109,751	34,973
Salted	12,706	5,890	792	43,431	16,438	2,126
Other descriptions	282,952	434,287	585,742	1,042,870	1,797,005	1,986,433
Total	342,107	455,808	546,357	1,516,765	1,923,194	2,023,532
MUTTON (fresh and refrigerated)—						
Netherlands	138,662	110,097	118,299	665,222	538,186	604,009
Uruguay	116,525	208,959	251,468	548,177	619,774	696,411
Argentine Republic	1,480,277	1,744,695	1,581,458	5,081,415	5,882,142	5,844,212
Australia	964,110	1,271,856	452,344	3,721,510	4,717,428	1,660,489
New Zealand	3,016,063	2,286,673	2,402,786	12,094,188	10,249,774	10,101,750
Other countries	163,126	242,426	315,124	480,978	766,218	1,025,887
Total	5,848,763	5,864,766	5,101,479	22,341,500	22,713,523	19,781,658
PORK (salted, not Bacon or Hams), from—						
Denmark	52,064	42,023	18,461	83,559	71,969	27,852
United States	27,739	22,084	16,316	108,448	74,088	56,088
Other countries	8,639	8,441	2,888	34,631	26,383	9,789
Total	88,442	72,498	37,665	226,638	175,435	93,179
PORK (fresh and refrigerated)—						
Netherlands	461,332	342,385	533,320	2,410,921	1,801,453	2,635,155
* Irish Free State . . . . .	..	232,532	248,605	..	996,432	1,065,452
China . . . . .	..	7,375	..	..	25,929	..
Argentine Republic	101,984	38,888	1,445	398,842	102,178	4,910
United States	80,341	291,539	169,380	395,335	1,804,025	734,275
Other countries	25,507	114,495	55,187	104,640	484,410	259,614
Total	669,164	1,016,599	1,008,337	3,809,738	4,714,472	4,699,412
RABBIT (dead), from—						
Belgium	3,537	14,956	18,018	19,133	85,773	81,261
Australia	218,514	196,964	133,541	411,888	451,761	299,696
New Zealand	10,433	8,567	8,169	18,667	20,623	13,245
Other countries	1,963	22,098	80,764	10,153	95,808	236,148
Total	234,453	238,585	241,132	460,041	653,964	634,750
Total of dead meat	26,447,185	31,118,205	36,181,434	101,968,691	109,062,340	104,625,900

* From 1st April 1922.

TABLE No. 11.—QUANTITIES AND VALUES OF BUTTER, MARGARINE, CHEESE, AND Eggs imported into the United Kingdom in each Year from 1922 to 1924 inclusive.

[From Trade and Navigation Returns.]

	Quantities.			Values.		
	1922.	1923.	1924.	1922.	1923.	1924.
BUTTER from—	Cwt.	Cwt.	Cwt.	£	£	£
Finland . .	117,274	116,076	134,564	1,097,270	1,009,292	1,297,658
Sweden . .	16,554	39,202	57,654	174,809	377,790	587,844
Denmark . .	1,423,796	1,837,941	1,734,161	18,969,688	16,757,198	18,117,414
Netherlands .	78,615	174,493	92,109	710,399	1,375,635	840,062
France . .	21,157	94,389	13,739	173,815	591,170	119,679
United States .	34,354	10,578	35,015	346,624	98,797	342,463
Argentine Republic .	356,158	491,256	538,754	2,781,441	3,948,962	4,425,502
*Irish Free State	...	492,354	461,311	...	3,751,095	4,111,402
Victoria . .	338,094	272,445	325,188	2,487,258	2,488,552	2,849,830
New S. Wales .	258,550	80,906	180,224	1,919,594	728,991	1,134,124
Queensland .	309,863	155,840	174,656	2,891,016	1,291,219	1,417,257
New Zealand .	1,103,444	1,130,765	1,088,667	9,340,703	10,205,809	10,003,108
Canada . .	154,532	89,834	131,374	1,530,768	346,446	1,269,186
Other countries	61,170	159,432	377,345	492,156	1,263,578	3,183,939
Total .	4,268,561	5,095,511	5,292,761	37,315,536	44,234,534	49,699,468
MARGARINE from—	Cwt.	Cwt.	Cwt.	£	£	£
Netherlands .	991,914	1,202,012	1,251,088	3,835,205	4,332,611	4,494,679
France . .	5,649	7,802	6,672	29,154	39,297	30,842
*Irish Free State	...	23,579	56,156	...	72,651	172,676
Other countries	1,607	4,777	1,428	5,711	15,252	5,089
Total .	999,170	1,238,170	1,315,344	3,870,070	4,459,811	4,703,277
CHEESE from—	Cwt.	Cwt.	Cwt.	£	£	£
Netherlands .	175,761	207,024	144,025	740,956	875,684	637,097
Italy . .	40,256	104,895	137,581	296,573	732,008	790,589
United States .	21,998	40,869	18,110	93,237	223,746	86,043
Australia . .	99,720	40,370	46,785	434,118	246,568	208,630
New Zealand .	1,294,779	1,368,654	1,479,842	5,883,957	7,507,511	6,545,472
Canada . .	949,042	1,001,612	1,005,985	4,493,503	5,284,205	4,688,835
Other countries	77,789	75,122	56,831	439,474	390,895	314,832
Total .	2,659,345	2,838,546	2,889,459	12,487,818	15,260,707	13,571,548
Eggs from—	Great Hundreds.	Great Hundreds.	Great Hundreds.	£	£	£
Lithuania . .	774,328	477,770	300,542	517,276	289,682	190,017
Denmark . .	5,734,577	6,757,300	6,044,743	5,644,967	5,486,324	5,495,772
Poland (including Dantzig .	902,354	1,284,922	730,571	575,176	710,902	431,288
Netherlands .	650,200	1,435,392	1,235,482	571,277	1,075,489	1,023,972
France . .	319,080	1,337,724	60,301	195,492	782,771	36,970
Italy . .	319,034	415,350	422,039	244,246	307,258	345,590
Serb-Croat-Slovene-State	460,474	419,844	53,819	319,336	244,998	32,978
Egypt . .	1,259,590	1,209,332	1,624,688	752,867	628,604	860,741
China . .	1,057,086	1,113,024	1,062,077	639,026	643,936	681,108
United States .	337,301	240,041	135,394	289,808	198,085	118,518
*Irish Free State	...	3,345,417	4,695,835	...	1,963,590	3,363,057
Canada . .	495,729	377,759	271,731	448,576	323,569	247,927
Other countries	1,361,918	1,632,068	3,691,431	1,103,605	1,161,633	2,676,361
Total .	13,661,671	20,045,943	9,317,653	11,301,652	13,216,896	15,504,314

From 1st April 1923.

TABLE NO. 12.—NUMBER AND VALUE OF LIVE CATTLE, SHEEP, AND PIGS imported into the United Kingdom in the undermentioned Years. [*From Trade and Navigation Returns.*]

	Number.			Value.		
	1922.	1923.	1924.	1922.	1923.	1924.
CATTLE, from—				£	£	£
Canada	19,960	45,417	76,978	567,787	1,267,191	2,202,850
United States	29,595	16,532	1,859	1,012,358	525,158	55,150
* Irish Free State . . . . .	..	522,446	931,614	..	9,480,661	16,866,496
Other countries	2	..	740	60	..	20,072
Total	49,657	584,395	1,011,191	1,580,155	11,263,005	19,144,568
SHEEP AND LAMBS, from—						
Canada . . . . .	..	201	..	..	500	..
United States . . . . .	..	6,800	..	..	24,249	..
* Irish Free State . . . . .	..	865,454	584,857	..	1,044,117	1,754,964
Other countries . . . . .	..	..	4,250	..	..	9,541
Total . . . . .	..	872,455	589,107	..	1,068,264	1,764,505
Pigs from—						
* Irish Free State . . . . .	..	279,005	234,536	..	1,696,920	1,170,160
Other countries . . . . .	..	..	..	..	..	..
TOTAL VALUE OF ANIMALS LIVING FOR FOOD	..	..	..	1,580,155	14,028,801	22,079,233

* From 1st April 1923.

TABLE NO. 13.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS imported into Great Britain from Ireland in each of the Years 1917-1924.

	1918.	1919.	1920.	1921.	1922.	1923.	1924.
† HORSES :—							
Stallions	808	884	976	268	847	444	400
Mares	8,402	8,028	11,494	11,816	11,445	11,487	12,760
Geldings	11,876	13,870	12,849	9,873	11,553	11,474	13,060
Total	20,081	21,782	24,719	21,452	23,845	23,405	26,220
CATTLE: Oxen, Bulls, and Cows :—							
Fat	375,705	531,842	452,481	376,138	420,808	283,666	345,167
Store	259,694	194,781	399,049	318,141	480,697	459,508	629,016
Other cattle	33,961	29,947	47,106	84,010	46,295	43,336	62,970
Calves	20,752	8,681	27,290	39,291	30,955	26,315	40,553
Total	720,112	765,251	925,926	767,490	978,255	812,730	1,077,706
SHEEP :—							
Sheep	310,837	276,915	343,525	343,651	337,032	156,970	377,848
Lambs	304,086	230,230	331,215	337,610	377,731	392,182	363,746
Total	614,873	507,145	574,740	581,261	714,763	449,152	641,594
Pigs :—							
Fat	165,712	192,540	158,872	62,794	128,504	314,816	179,611
Store	4,587	8,773	7,750	8,056	205	3,425	6,389
Total	170,309	199,313	166,622	65,850	128,709	318,241	186,000

† Not including Army Horses.

EDINBURGH CORN MARKET.

STATEMENT SHOWING THE PRICES OF WHEAT, BARLEY, AND OATS FOR THE YEAR 1924.

The offering of grain by farmers and others in the area of the Market was not resumed during the year except for the exposure of a few samples of Wheat and Oats at intervals. It is hoped that advantage will be taken of the privilege afforded to farmers and merchants of offering grain in the open market, as undoubtedly it enables them to secure the market value, and gives a desirable indication of the true value of the various grains.

The Corn Sales Act of 1921 provides that all sales are to be effected by weight only, and expressed in terms of or by reference to the hundredweight of 112 lb. Experience has proved it to be convenient to quote at a price per 4½ cwt. for Wheat, 4 cwt. for Barley, and 3 cwt. for Oats.

The following statement gives a record of the year's proceedings in Edinburgh Corn Market.

1924.		WHEAT, per 4½ cwt.		BARLEY, per 4 cwt.		OATS, per 3 cwt.			
		Highest.	Lowest.	Highest.	Lowest.	Milling.		Feeding.	
						Highest.	Lowest.	Highest.	Lowest.
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January	2								
"	9	44 6	43 6	43 6	39 0	28 6	28 8	..	..
"	16	45 0	44 0	43 6	39 0	28 6	28 8	..	..
"	23	46 0	45 0	43 6	39 0	29 0	28 6	28 0	27 6
"	30	47 0	45 6	43 6	39 0	29 0	28 6	28 0	27 0
February	6	48 6	47 6	43 6	39 0	28 6	28 8	27 6	27 0
"	13	48 0	47 0	43 6	39 0	28 8	28 8	27 6	27 0
"	20	48 0	47 6	42 6	38 0	28 6	28 8	27 6	27 0
"	27	47 0	46 0	43 0	38 0	28 6	28 8	27 6	27 3
March	5	47 0	46 0	42 6	38 0	28 6	28 8	27 6	27 0
"	12	46 0	45 0	42 6	38 0	28 6	28 8	27 6	27 3
"	19	45 6	45 0	43 0	38 6	28 6	28 0	27 6	27 0
"	26	45 0	44 6	43 0	38 0	28 9	28 6	28 0	27 9
April	2	46 0	45 0	43 0	38 0	29 0	28 6	28 0	27 9
"	9	47 0	46 0	43 0	38 0	29 0	28 9	28 8	28 0
"	16	47 0	46 0	43 0	38 0	29 6	29 0	28 6	28 0
"	23	47 0	46 6	43 0	38 0	30 0	29 6	29 0	28 6
"	30	47 6	46 6	43 0	38 0	30 0	29 6	29 0	28 6
May	7	48 0	47 6	45 0	42 0	30 6	30 0	29 6	29 0
"	14	48 0	47 0	45 0	42 0	31 0	30 6	29 0	28 0
"	21	48 0	47 0	47 0	46 0	31 0	30 6	29 0	28 6
"	28	47 0	46 0	47 0	46 0	31 0	30	29 0	28 6
June	4	47 6	47 0	47 0	46 0	30 6	30 0	28 6	28 0
"	11	48 0	47 0	47 0	46 0	30 0	29 6	28 6	28 0
"	18	48 6	48 0	..	..	29 8	29 0	28 0	27 6
"	25	49 0	48 6	..	..	29 8	29 0	28 6	27 6
July	2	50 0	49 0	..	..	29 0	28 6	27 6	27 0
"	9	51 0	50 0	..	..	29 0	28 6	28 0	27 0
"	16	54 0	53 0	..	..	30 0	29 6	28 6	28 0
"	23	57 0	56 0	..	..	31 0	30 6	28 6	28 0
"	30	60 0	59 0	..	..	32 0	31 6	29 6	29 0
August	6	68 0	62 0	..	..	33 6	33 0	31 0	30 0
"	13	68 0	62 0	..	..	33 6	32 6	31 0	30 0
"	20	62 0	61 0	..	..	33 6	33 0	31 6	30 0
"	27	61 0	60 0	..	..	35 6	32 6	31 0	30 6
September	3	60 0	59 0	..	..	35 0	32 0	31 0	30 0
"	10	61 0	59 0	62 0	60 0	35 0	32 0	31 0	30 0
"	17	..	..	65 0	47 6	35 0	32 0	31 0	30 0
"	24	..	..	70 0	55 0	34 6	33 0	31 0	30 0
October	1	56 0	55 0	65 0	45 0	33 6	32 6	..	..
"	8	56 0	55 0	67 6	50 0	33 0	32 6	..	..
"	15	54 6	50 0	70 0	45 0	33 0	32 6	31 6	30 0
"	22	56 0	50 0	65 0	45 0	33 0	32 0	31 6	30 0
"	29	50 0	45 0	67 6	45 0	32 0	31 6	30 6	28 6
November	5	53 0	45 0	65 0	45 0	31 6	31 0	30 0	29 0
"	12	54 0	45 6	62 0	45 0	31 0	30 6	29 0	28 0
"	19	55 0	45 0	60 0	40 0	30 6	30 0	28 0	27 0
"	26	50 0	46 0	58 0	40 0	29 6	29 0	28 0	27 6
December	3	54 0	45 0	60 0	35 0	29 0	28 6	27 6	27 0
"	10	57 0	50 0	58 0	35 0	28 6	28 0	27 0	26 0
"	17	56 0	45 0	60 6	35 0	29 0	28 6	27 0	26 0
"	24	58 0	54 0	60 0	35 6	29 6	29 0	27 6	26 6
"	31	58 0	52 0	60 0	40 0	30 6	29 6	28 0	27 0

PRICES OF SHEEP SINCE 1818.

TABLE No. 1.—CHEVIOT SHEEP.

Year.	Wethers.		Ewes.		Lambs.	
	s.	d.	s.	d.	s.	d.
1818	28	0 to 80	0	0	8	0 to 10
1819	25	0 "	27	0	10	6 "
1820	20	0 "	25	0	10	0 "
1821	18	0 "	20	0	7	6 "
1822	12	6 "	18	0	4	6 "
1823	13	6 "	18	0	5	6 "
1824	14	0 "	19	0	4	6 "
1825	20	0 "	32	0	9	0 "
1826	17	6 "	21	6	7	0 "
1827	15	0 "	24	0	7	0 "
1828	18	0 "	27	6	7	0 "
1829	18	0 "	24	0	7	0 "
1830	15	0 "	21	0	6	0 "
1831	18	0 "	25	0	7	0 "
1832	19	0 "	24	0	7	0 "
1833	22	0 "	31	0	8	0 "
1834	22	0 "	31	0	9	0 "
1835	22	0 "	27	6	8	0 "
1836	24	0 "	31	6	10	0 "
1837	19	0 "	28	0	10	0 "
1838	23	0 "	30	6	12	0 "
1839	23	0 "	31	0	0	0 "
1840	24	0 "	33	0	7	0 "
1841	23	0 "	30	0	8	0 "
1842	22	6 "	28	0	7	6 "
1843	19	0 "	25	0	5	0 "
1844	21	0 "	29	0	8	0 "
1845	23	0 "	33	0	8	0 "
1846	24	0 "	33	6	10	0 "
1847	24	0 "	35	0	11	6 "
1848	23	0 "	34	6	11	6 "
1849	21	0 "	30	2	0	0 "
1850	20	6 "	29	6	8	0 "
1851	21	6 "	31	0	8	9 "
1852	21	0 "	32	0	8	0 "
1853	26	6 "	38	0	9	0 "
1854	25	0 "	36	0	9	0 "
1855	23	6 "	36	0	10	0 "
1856	22	0 "	35	6	10	0 "
1857	24	0 "	36	0	10	6 "
1858	24	0 "	34	6	10	6 "
1859	25	0 "	34	6	10	3 "
1860	26	0 "	38	0	12	6 "
1861	25	0 "	38	6	9	0 "
1862	27	0 "	37	6	10	0 "
1863	25	0 "	38	6	10	6 "
1864	31	0 "	41	0	14	0 "
1865	32	6 "	44	0	14	6 "
1866	37	0 "	50	0	15	0 "
1867	26	0 "	58	0	12	0 "
1868	30	0 "	32	0	7	6 "
1869	28	0 "	38	0	7	6 "
1870	35	6 "	43	0	10	0 "
1871	36	6 "	49	0	14	0 "
1872	45	0 "	56	0	16	0 "
1873	42	0 "	51	0	15	6 "
1874	38	6 "	44	6	12	0 "
1875	33	0 "	48	6	13	6 "
1876	40	0 "	52	6	13	6 "
1877	41	0 "	51	0	15	0 "
1878	35	6 "	48	0	14	0 "
1879	34	0 "	44	0	14	0 "

TABLE NO. 1.—CHEVIOT SHEEP—Continued.

Year.	Wethers.		Ewes.		Lambs.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1880	30 0	to 48 6	30 0	to 30 0	12 6	to 30 0
1881	32 0	" 45 6	29 0	" 34 0	14 0	" 30 0
1882	40 0	" 51 0	30 0	" 40 0	14 0	" 30 6
1883	44 0	" 55 6	34 6	" 46 6	15 6	" 33 0
1884	36 0	" 47 6	29 6	" 41 6	12 6	" 30 0
1885	30 0	" 38 0	24 0	" 31 0	12 0	" 18 0
1886	32 0	" 40 0	21 0	" 29 0	12 6	" 19 0
1887	39 0	" 56 0	18 0	" 26 0	11 0	" 16 6
1888	30 0	" 38 0	19 0	" 27 0	12 0	" 17 6
1889	38 0	" 44 0	24 0	" 32 0	14 0	" 22 0
1890	31 0	" 40 0	22 0	" 30 0	12 6	" 20 0
1891	27 0	" 38 0	16 0	" 26 0	9 0	" 16 0
1892	32 0	" 40 6	18 0	" 22 0	5 0	" 11 0
1893	36 0	" 45 6	18 0	" 28 6	8 6	" 15 0
1894	26 0	" 37 0	20 0	" 31 0	10 6	" 18 6
1895	38 0	" 49 0	22 0	" 34 0	11 6	" 19 6
1896	34 6	" 34 0	19 0	" 30 6	9 6	" 16 6
1897	27 0	" 36 0	21 0	" 31 6	11 0	" 17 6
1898	27 0	" 37 0	22 0	" 32 6	12 0	" 18 6
1899	24 0	" 33 0	20 0	" 30 6	10 6	" 16 0
1900	26 0	" 36 0	22 0	" 32 6	12 0	" 17 0
1901	25 0	" 32 6	20 0	" 29 6	11 0	" 16 6
1902	24 0	" 31 6	18 0	" 27 0	9 6	" 14 6
1903	26 0	" 34 0	21 0	" 31 6	11 4	" 18 0
1904	28 6	" 36 6	23 0	" 32 6	13 0	" 20 0
1905	27 6	" 35 0	23 0	" 33 0	14 0	" 21 0
1906	30 0	" 38 0	26 0	" 34 6	15 0	" 23 0
1907	28 0	" 34 0	22 0	" 30 6	13 6	" 12 6
1908	26 0	" 32 6	21 0	" 27 6	11 6	" 17 0
1909	24 0	" 31 0	18 0	" 25 6	9 6	" 16 0
1910	27 0	" 35 0	22 0	" 31 0	12 0	" 20 0
1911	24 0	" 31 6	18 6	" 27 6	10 6	" 18 0
1912	26 0	" 34 6	22 0	" 31 0	13 0	" 21 0
1913	30 0	" 39 0	24 0	" 35 6	16 0	" 24 0
1914	32 6	" 41 0	28 0	" 39 0	18 0	" 27 6
1915	36 0	" 46 0	31 0	" 44 0	20 0	" 30 6
1916	40 6	" 51 0	34 0	" 49 0	22 0	" 34 6
1917	48 6	" 56 0	38 0	" 56 0	24 0	" 34 0
1918	50 0	" 66 0	42 0	" 61 0	25 0	" 37 0
1919	53 0	" 69 0	44 6	" 67 0	28 0	" 40 6
1920	56 0	" 91 0	48 0	" 79 0	34 0	" 49 0
1921	45 0	" 60 0	52 3	" 85 9	33 9	" 52 3
1922	40 0	" 56 0	56 0	" 90 6	27 0	" 50 0
1923	44 0	" 65 0	61 0	" 106 0	30 0	" 62 0
1924	41 0	" 61 0	60 0	" 100 0	Ewe lambs— 40 0 to 65 6 Wether lambs— 31 6 to 53 0	

TABLE NO. 2.—BLACKFACE SHEEP.

Year.	Wethers.		Ewes.		Lambs.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1819	22 0	to 24 0	12 0	to 15 0	8 0	to 9 0
1820	30 0	" 28 8	15 6	" 17 0	7 0	" 8 6
1821	18 0	" 20 0	12 0	" 18 0	6 0	" 7 0
1822	11 6	" 18 6	5 6	" 6 0	4 6	" 0 0
1823	12 0	" 16 0	5 0	" 6 6	4 0	" 5 3
1824	9 6	" 12 6	6 0	" 7 0	4 0	" 5 0
1825	22 0	" 26 0	11 0	" 18 6	6 0	" 9 0
1826	15 0	" 17 0	8 0	" 9 0	4 6	" 6 0
1827	14 0	" 18 6	7 0	" 10 6	6 0	" 7 6
1828	15 0	" 20 0	8 0	" 11 0	5 0	" 7 6
1829	14 0	" 18 0	9 0	" 10 0	6 0	" 7 0
1830	9 6	" 12 0	4 0	" 6 0	4 6	" 6 0
1831	18 0	" 17 0	5 0	" 7 6	5 0	" 6 6
1832	14 0	" 18 0	7 0	" 11 6	6 0	" 7 3
1833	16 0	" 24 0	7 6	" 12 0	6 6	" 9 0

TABLE No. 2.—BLACKFACE SHEEP—Continued.

Year.	Wethers.		Ewes.		Lambs.	
	s.	d.	s.	d.	s.	d.
1884	18 0	to 22 0	10 0	to 18 0	6 0	to 8 6
1885	18 0	" 18 0	10 0	" 18 0	7 0	" 8 0
1886	18 0	" 21 0	9 0	" 12 0	8 6	" 11 0
1887	18 0	" 16 0	8 0	" 12 0	8 0	" 9 6
1888	18 0	" 20 6	10 0	" 13 0	not quoted.	
1889	18 0	" 22 0	10 0	" 12 0	7 0	to 8 8
1890	18 0	" 22 6	11 0	" 12 0	7 0	" 9 8
1891	16 0	" 20 0	9 0	" 11 0	6 0	" 8 0
1892	14 0	" 19 0	7 6	" 8 6	5 6	" 7 0
1893	not quoted.		4 9	" 6 6	not quoted.	
1894	18 0	to 21 0	6 6	" 10 0	5 0	to 8 0
1895	14 0	" 23 0	8 0	" 12 0	6 0	" 8 0
1896	18 0	" 24 0	10 0	" 18 0	8 0	" 9 0
1897	20 6	" 25 0	10 0	" 14 0	8 6	" 9 6
1898	20 0	" 24 0	11 3	" 12 0	8 6	" 10 0
1899	not quoted.		not quoted.		7 0	" 7 6
1890	..		..		7 0	" 0 0
1891	17 6	to 23 0	9 0	to 12 0	6 6	" 8 0
1892	18 6	" 22 0	9 6	" 12 0	4 6	" 7 9
1893	23 0	" 27 0	14 6	" 16 6	8 0	" 11 6
1894	20 0	" 26 0	11 0	" 16 6	8 0	" 10 6
1895	23 6	" 26 6	14 0	" 16 0	10 0	" 11 0
1896	17 0	" 24 0	10 0	" 20 0	7 6	" 10 0
1897	20 0	" 29 0	10 6	" 15 0	9 3	" 11 0
1898	20 0	" 27 6	9 9	" 18 9	8 3	" 10 6
1899	20 0	" 25 0	10 0	" 14 0	8 9	" 11 0
1890	21 0	" 27 3	11 0	" 16 0	10 0	" 18 6
1891	21 0	" 29 0	12 0	" 22 0	6 3	" 14 0
1892	16 9	" 27 0	12 0	" 18 8	6 0	" 12 0
1893	20 0	" 20 6	18 0	" 16 0	8 0	" 11 6
1894	25 0	" 20 0	15 0	" 19 0	10 0	" 18 6
1895	15 6	" 22 6	15 0	" 25 0	10 0	" 17 0
1896	21 6	" 40 0	20 0	" 36 0	18 6	" 22 6
1897	20 0	" 20 6	14 0	" 22 0	7 6	" 13 6
1898	20 0	" 26 0	10 6	" 18 6	7 0	" 18 0
1899	22 0	" 28 0	11 0	" 14 0	6 9	" 9 0
1890	27 0	" 32 6	13 0	" 22 0	8 0	" 14 6
1891	23 0	" 27 0	13 0	" 28 0	11 0	" 16 3
1892	31 6	" 45 0	18 0	" 32 0	12 6	" 18 0
1893	28 0	" 39 0	16 6	" 27 0	7 0	" 16 0
1894	25 0	" 35 0	13 0	" 20 0	7 0	" 14 0
1895	26 6	" 27 6	15 0	" 31 3	9 6	" 17 6
1896	30 0	" 40 0	19 0	" 24 0	13 0	" 20 6
1897	35 0	" 38 9	18 0	" 25 0	13 6	" 23 0
1898	30 0	" 36 0	17 0	" 28 0	12 0	" 22 0
1899	25 0	" 35 9	16 0	" 24 0	10 6	" 20 0
1890	25 0	" 38 0	16 6	" 22 6	10 0	" 17 0
1891	30 0	" 39 0	15 0	" 28 0	10 0	" 16 0
1892	33 0	" 46 0	20 0	" 28 0	12 6	" 18 6
1893	36 0	" 50 6	24 6	" 33 0	14 0	" 21 6
1894	39 0	" 43 6	19 6	" 28 0	12 0	" 19 6
1895	24 0	" 34 0	13 0	" 22 6	10 0	" 15 0
1896	25 0	" 34 0	12 0	" 22 0	10 6	" 16 0
1897	22 0	" 30 0	11 0	" 19 0	8 0	" 13 0
1898	22 0	" 32 0	13 0	" 24 0	10 0	" 15 0
1899	26 0	" 49 0	18 0	" 29 0	13 0	" 22 0
1890	24 0	" 37 0	14 0	" 27 0	10 6	" 19 0
1891	21 0	" 37 0	19 0	" 24 0	7 6	" 16 0
1892	16 0	" 28 6	6 0	" 17 0	3 0	" 10 0
1893	21 0	" 37 0	12 0	" 24 0	7 0	" 14 6
1894	20 0	" 37 6	14 6	" 26 6	8 6	" 16 0
1895	23 0	" 41 0	16 0	" 28 6	9 0	" 17 0
1896	19 0	" 35 4	13 0	" 24 0	6 0	" 13 6
1897	21 0	" 36 6	15 0	" 35 6	7 0	" 14 6
1898	22 0	" 37 0	16 0	" 36 6	8 0	" 15 0
1899	20 0	" 33 6	13 0	" 24 0	5 6	" 13 0
1900	23 0	" 36 0	16 0	" 26 6	8 0	" 15 6
1901	20 0	" 35 0	14 0	" 25 6	6 6	" 14 6
1902	18 6	" 34 0	12 0	" 24 0	6 0	" 14 0
1903	21 0	" 36 0	15 0	" 28 0	7 0	" 16 6
1904	23 0	" 38 6	18 0	" 30 0	8 6	" 17 6
1905	21 6	" 37 0	19 0	" 31 0	9 0	" 18 6

TABLE NO. 2.—BLACKFACE SHEEP—*Continued.*

Year.	Wethers.				Ewes.				Lambs.			
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
1906	23	0 to	33	0	30	0 to	33	0	10	0 to	19	6
1907	21	0 "	33	6	17	0 "	33	0	8	6 "	17	6
1908	19	6 "	30	0	15	0 "	24	6	8	0 "	16	0
1909	17	0 "	28	0	11	6 "	32	0	6	3 "	13	0
1910	21	0 "	32	6	16	0 "	27	6	8	0 "	17	0
1911	19	0 "	29	6	14	0 "	24	0	7	0 "	15	0
1912	21	6 "	32	6	17	0 "	27	6	9	6 "	17	6
1913	24	6 "	36	0	21	0 "	31	0	12	6 "	21	6
1914	27	0 "	38	6	25	0 "	34	6	15	6 "	24	0
1915	31	0 "	42	6	29	0 "	39	6	17	0 "	25	6
1916	33	0 "	46	6	31	0 "	42	0	19	0 "	27	6
1917	36	0 "	51	0	33	0 "	47	0	21	0 "	30	0
1918	41	0 "	56	0	36	0 "	50	0	27	0 "	33	0
1919	44	0 "	62	0	39	0 "	54	0	29	0 "	36	0
1920	46	0 "	66	0	44	0 "	62	0	31	0 "	43	0
1921	52	9 "	60	9	35	3 "	62	6	20	3 "	47	0
1922	40	3 "	68	0	40	6 "	74	0	18	0 "	44	0
1923	46	0 "	65	6	43	0 "	78	0	21	0 "	45	6
1924	46	0 "	68	6	45	6 "	85	0	25	0 "	55	6

Year.	Laid Cheviot.				White Cheviot.		Laid Highland.				White Highland.	
	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.	s.	d.
1818	40	0 to	43	2	..	..	20	0 to	22	6	..	..
1819	21	0 "	22	0	..	..	10	0 "	10	3	..	..
1820	20	0 "	22	0	..	..	9	0 "	10	0	..	..
1821	18	0 "	20	0	..	..	9	0 "	10	0	..	..
1822	12	6 "	14	6	..	..	5	0 "	6	6	..	..
1823	9	0 "	10	6	..	..	5	0 "	5	9	..	..
1824	13	6 "	15	0	..	..	6	0 "	6	3	..	..
1825	10	6 "	22	0	..	..	10	0 "	10	6	..	..
1826	11	0 "	14	0	..	..	5	0 "	5	6	..	..
1827	11	0 "	14	0	..	..	5	6 "	6	9	..	..
1828	8	0 "	11	0	..	..	5	6 "	6	0	..	..
1829	8	6 "	11	0	..	..	4	3 "	0	0	..	..
1830	9	6 "	11	0	..	..	4	6 "	5	0	..	..
1831	17	0 "	20	0	..	..	7	6 "	8	6	..	..
1832	14	0 "	18	6	..	..	7	0 "	7	6	..	..
1833	18	6 "	20	7	..	..	10	0 "	11	0	..	..
1834	21	0 "	24	6	..	..	5	6 "	7	0	..	..
1835	19	0 "	20	6	..	..	9	6 "	10	3	..	..
1836	21	0 "	25	0	..	..	10	0 "	14	0	..	..
1837	12	0 "	14	0	..	..	7	0 "	7	3	..	..
1838	19	0 "	22	6	..	..	6	0 "	10	0	..	..
1839	18	0 "	20	0	..	..	8	0 "	12	0	..	..
1840	15	0 "	0	0	..	..	7	0 "	0	0	..	..
1841	15	0 "	16	9	..	..	6	0 "	7	5	..	..
1842	12	6 "	14	0	..	..	not quoted.		..	..	..	..
1843	9	0 "	11	6	..	..	5	0 to	6	0	..	..
1844	15	0 "	18	0	..	..	not quoted.		..	..	..	..
1845	14	6 "	17	6	..	..	7	6 to	8	6	..	..
1846	12	0 "	14	6	..	..	3	0 "	8	6	..	..
1847	12	6 "	14	0	..	..	not quoted.		..	..	..	..
1848	9	6 "	11	0	..	..	4	9 to	0	0	..	..
1849	12	0 "	16	6	..	..	6	0 "	6	3	..	..
1850	15	0 "	17	6	..	..	8	0 "	8	6	..	..
1851	12	0 "	16	0	..	..	8	0 "	9	3	..	..
1852	18	0 "	15	0	..	..	8	0 "	9	0	..	..
1853	19	0 "	22	0	..	..	11	0 "	12	6	..	..
1854	12	0 "	15	0	..	..	7	6 "	8	6	..	..
1855	14	6 "	19	0	..	..	8	6 "	9	0	..	..
1856	19	0 "	21	6	..	..	11	0 "	0	0	..	..
1857	19	0 "	24	0	..	..	18	0 "	14	3	..	..
1858	15	0 "	17	0	..	..	8	9 "	10	0	..	..

TABLE No. 3.—PRICE OF WOOL—Continued.

Year.	Laid Cheviot.		White Cheviot.		Laid Highland.		White Highland.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1850	18 6	to 24 0			10 9	to 11 6		
1850	22 0	" 32 0	27 0	to 38 0	10 0	" 11 8		
1861	19 6	" 27 0	from 80s. upwards.		not quoted.			
1862	18 6	" 26 0	30 0	to 37 0	11 6	to 16 0		
1863	25 6	" 31 0	38 0	" 42 0	15 8	" 17 6		
1864	31 0	" 39 0	47 0	" 54 0	17 6	" 20 0		
1865	28 0	" 30 0	44 0	" 45 0	15 0	" 17 0		
1866	24 0	" 30 0	30 0	" 38 0	14 0	" 16 0		
1867	16 0	" 21 6	not quoted.		not quoted.			
1868	19 0	" 26 0	28 0	to 32 0	8 6	to 9 0		
1869	18 0	" 28 6	not quoted.		8 6	" 10 0		
1870	15 0	" 23 6	25 0	to 26 0	9 6	" 0 0		
1871	20 0	" 26 6	30 0	" 34 6	12 0	" 15 0		
1872	26 0	" 37 6	40 0	" 48 0	18 0	" 21 0		
1873	17 0	" 18 0	34 0	" 40 0	9 0	" 12 0		
1874	18 6	" 26 6	30 0	" 34 0	9 6	" 18 0		
1875	25 0	" 32 0	34 6	" 36 0	12 6	" 16 0		
1876	30 0	" 24 0	30 0	" 34 6	9 6	" 12 0		
1877	26 0	" 26 0	28 0	" 30 0	10 0	" 12 0		
1878	18 9	" 25 0	27 0	" 32 0	8 6	" 11 6		
1879	15 0	" 17 0	prices very low.		7 0	" 0 0		
1880	20 0	" 24 0	30 0	to 32 0	10 6	" 11 6	14 0	to 15 0
1881	17 0	" 21 0	27 0	" 30 0	5 0	" 9 6	12 0	" 18 0
1882	14 0	" 18 0	27 6	" 28 0	7 6	" 9 0	13 0	" 14 0
1883	12 0	" 18 0	26 0	" 28 0	6 6	" 8 6	11 6	" 12 6
1884	18 0	" 18 0	26 0	" 28 0	6 6	" 8 6	11 6	" 12 6
1885	12 0	" 17 0	22 6	" 26 0	6 0	" 8 0	11 6	" 12 0
1886	12 0	" 18 0	23 0	" 27 6	6 6	" 8 6	11 6	" 12 0
1887	14 0	" 22 0	23 0	" 28 0	7 0	" 9 0	11 6	" 18 0
1888	13 0	" 20 0	23 0	" 28 0	7 0	" 9 0	11 0	" 12 6
1889	18 0	" 18 0	24 0	" 28 0	7 0	" 9 0	11 0	" 12 6
1890	18 0	" 18 0	24 0	" 28 0	7 0	" 9 0	11 0	" 12 6
1891	12 6	" 18 0	22 0	" 28 0	7 0	" 9 0	10 6	" 12 6
1892	12 0	" 18 0	20 0	" 28 0	7 0	" 8 6	10 0	" 12 0
1893	12 0	" 17 0	20 0	" 27 0	7 0	" 8 0	10 0	" 12 0
1894	12 0	" 16 0	20 0	" 26 0	7 0	" 8 0	10 0	" 12 0
1895	12 0	" 14 6	20 0	" 25 0	7 0	" 8 0	10 0	" 11 6
1896	11 0	" 15 0	19 0	" 24 0	7 0	" 8 0	10 0	" 11 6
1897	11 0	" 14 0	18 0	" 23 0	7 0	" 8 0	10 6	" 12 0
1898	10 0	" 18 0	16 0	" 20 6	7 0	" 8 0	10 0	" 11 6
1899	10 0	" 18 0	13 0	" 18 6	7 0	" 8 0	8 6	" 9 6
1900	9 9	" 12 0	13 0	" 18 6	6 9	" 7 9	8 0	" 9 6
1901	9 0	" 10 0	11 0	" 16 6	5 9	" 6 6	8 0	" 9 0
1902	9 0	" 10 0	11 6	" 17 0	6 0	" 6 6	8 6	" 9 6
1903	10 0	" 12 0	15 0	" 18 0	7 0	" 8 0	11 6	" 12 6
1904	15 0	" 17 0	20 0	" 21 0	9 0	" 10 0	14 0	" 15 0
1905	17 0	" 30 0	24 0	" 26 0	10 0	" 11 0	15 0	" 16 0
1906	18 0	" 31 0	27 0	" 28 6	11 6	" 18 0	16 6	" 17 6
1907	*	*	22 0	" 24 0	11 0	" 12 6	16 0	" 17 0
1908	*	*	16 0	" 18 0	†	†	8 0	" 8 6
1909	*	*	24 0	" 26 0	†	†	12 6	" 14 0
1910	*	*	25 0	" 30 0	†	†	18 0	" 14 6
1911	*	*	25 0	" 30 0	†	†	13 0	" 14 6
1912	*	*	24 0	" 29 0	†	†	14 0	" 15 0
1913	*	*	25 0	" 30 0	†	†	17 0	" 18 0
1914	*	*	24 0	" 29 0	†	†	15 0	" 15 6
1915 †	*	*	42 0	" 46 0	†	†	21 0	" 22 0

* No Cheviots smeared now.

† No Highlands smeared now.

‡ These are July prices.

PRICE OF WOOL PER STONE OF 24 LB.—*Continued.*

		CHEVIOT.				HALF-BRED.				BLACK-FACE.		CROSS-BRED (BLACKFACE EWE AND LEICESTER RAM).			
		Hogg.		EWE AND WETHER.		Hogg.		EWE AND WETHER.		Hogg.	EWE AND WETHER.	Hogg.		EWE AND WETHER.	
		Washed.	Un- washed.	Washed.	Un- washed.	Washed.	Un- washed.	Washed.	Un- washed.			Washed.	Un- washed.	Washed.	Un- washed.
1916	CAITHNESS & SUTH- ERLAND	s. d. 36 6	s. d. 30 0	s. d. 33 0	s. d. 27 6	s. d. 34 6	s. d. 28 6	s. d. 33 0	s. d. 27 6	s. d. 23 0	s. d. 23 0	s. d. 23 6	s. d. 25 6	s. d. 28 6	s. d. 25 6
1917	CAITHNESS & SUTH- ERLAND	40 0	32 6	34 0	29 0	35 0	29 0	34 0	28 6	25 6	25 6	31 6	28 6	31 6	28 6
1918	CAITHNESS & SUTH- ERLAND	44 6	36 0	37 6	32 6	39 0	32 6	37 6	31 6	27 0	27 0	33 6	30 6	33 6	30 6
1919	CAITHNESS & SUTH- ERLAND	48 6	38 6	40 0	34 6	41 6	34 6	40 0	33 6	34 0	34 0	46 0	39 0	44 0	38 0
1920	CAITHNESS & SUTH- ERLAND	88 0	74 0	84 0	68 0	84 0	68 0	72 0	60 0	24 0	24 0	35 0	29 0	34 0	27 0
1921	CAITHNESS & SUTH- ERLAND	86 0	70 0	83 0	66 0	74 0	54 0	65 0	50 0	9 6	9 6	12 0	10 0	12 0	10 0
1922	CAITHNESS & SUTH- ERLAND	22 0	17 0	19 0	15 0	18 6	14 6	16 0	13 0	16 0	16 0	16 0	15 0	16 6	15 0
1923	CAITHNESS & SUTH- ERLAND	23 0	18 0	20 0	16 0	19 6	15 6	17 0	14 0	17 0	17 6	20 0	18 0	20 0	18 0
1924	CAITHNESS & SUTH- ERLAND	80 0	25 0	26 0	22 0	26 0	20 0	23 0	18 0	25 6	25 6	34 6	30 6	33 0	30 0
	CAITHNESS & SUTH- ERLAND	81 6	26 0	27 0	23 0	27 0	21 0	23 0	19 0						
	CAITHNESS & SUTH- ERLAND	41 0	34 0	36 0	30 0	33 0	27 0	30 0	25 0						
	CAITHNESS & SUTH- ERLAND	43 0	35 0	37 0	31 0	34 0	28 0	31 0	26 0						
	CAITHNESS & SUTH- ERLAND	58 0	49 0	53 0	45 0	49 0	40 0	45 0	39 0						
	CAITHNESS & SUTH- ERLAND	60 0	50 0	54 0	46 0	50 0	41 0	46 0	40 0						

¹ The prices given were prices fixed by Government, and not free market prices.

GENERAL SHOW AT PERTH, 1924.

THE ninety-third Show of the Society, and the tenth at Perth, was held on Tuesday, 15th July, and three following days. Good weather favoured the meeting, the week of the Show being probably the best in what was otherwise a disastrously wet season. On one day, Wednesday, rain fell heavily in the early morning, but it ceased by 9 A.M. Whilst this no doubt affected the attendance on that day, the total attendance was most gratifying, the number who paid at the gates during the week reaching a total of 58,053, which compared with 26,870 at Cupar in 1912, and 46,429 at Perth in 1904.

Besides the excellent and convenient site provided on the South Inch, the town of Perth gave a free supply of water and electric current, and a donation of £100 to the Show funds. The local authorities of both the town and county co-operated heartily with the Society in furthering the success of the Show.

The exhibition of Live Stock was of the usual high standard. Certain classes, especially in the Pig section, were reduced in numbers through foot-and-mouth disease restrictions, which prevented the exhibition of stock from England or Scottish stock which had been exhibited at the Royal Show at Leicester. The collection of Agricultural Implements and Machinery was exceptionally large and interesting.

It is gratifying to report that the Accounts showed a credit balance of about £2336.

STATISTICS.

The following tables give the number of entries in the various sections :—

1. CATTLE.

Class.	SHORTHORN.	No. of Entries.
1. Aged bulls	9
2. Two-year-old bulls	6
3. Two-year-old bulls	4
4. One-year-old bulls	9
5. One-year-old bulls	15
6. Cows of any age	9
7. Two-year-old cows or heifers	9
8. One-year-old heifers	14
9. One-year-old heifers	19
		— 94

DAIRY SHORTHORN.

10. Cows of any age	} Cancelled— Insufficient entries.
11. Cows or heifers born in or after 1921	
12. Bulls born in 1923	

ABERDEEN-ANGUS.

13. Aged bulls . . . . .	. . . . .	7
14. Two-year-old bulls . . . . .	. . . . .	10
15. One-year-old bulls . . . . .	. . . . .	19
16. Cows of any age . . . . .	. . . . .	12
Extra Stock . . . . .	. . . . .	1
17. Three-year-old cows . . . . .	. . . . .	8
18. Two-year-old cows or heifers . . . . .	. . . . .	12
19. One-year-old heifers . . . . .	. . . . .	29
20. One-year-old heifers . . . . .	. . . . .	7
		— 105

GALLOWAY.

21. Aged bulls . . . . .	. . . . .	4
22. Two-year-old bulls . . . . .	. . . . .	3
23. One-year-old bulls . . . . .	. . . . .	4
24. Cows of any age . . . . .	. . . . .	6
Extra Stock . . . . .	. . . . .	1
25. Two-year-old cows or heifers . . . . .	. . . . .	12
26. One-year-old heifers . . . . .	. . . . .	11
		— 41

HIGHLAND.

27. Aged bulls . . . . .	. . . . .	4
28. Two-year-old bulls . . . . .	. . . . .	5
29. One-year-old bulls . . . . .	. . . . .	4
30. Cows of any age . . . . .	. . . . .	8
31. Three-year-old cows or heifers . . . . .	. . . . .	8
32. Two-year-old heifers . . . . .	. . . . .	8
		— 37

AYRSHIRE.

33. Cows in milk, born before 1921	4
34. Cows in milk, born after 1st January 1921	2
35. Cows of any age, in calf, and due to calve before 1st December of the year of the Show	5
36. Heifer, born in or after 1921, in calf, and due to calve before 1st December of the year of the Show	8
37. Two-year-old heifers	6
38. One-year-old heifers	5
39. Aged bulls	4
40. Two-year-old bulls	2
41. One-year-old bulls	3
	— 39

BRITISH FRIESIAN.

42. Bulls born in or before 1921	4
43. Bulls born in 1922	4
44. Bulls born in 1922	7
45. Cows in milk, born in or before 1920	6
46. Cows in calf and not in milk, born in or before 1920	4
47. Cows or heifers in milk, born in 1921 or 1922	4
48. Heifers in calf with first calf, to calve before 3 years old	8
49. Heifers born before 1st July 1923	14
50. Heifer born on or after 1st July 1923	4
	— 55

RED POLL.

51. Bulls born in or before 1922	3
52. Bulls born in 1923	3
53. Cows in milk, born before 1922	3
54. Heifers born in 1922	2
55. Heifers born in 1923	2
	— 13

BELTED GALLOWAY.

56. Bulls born before 1st December 1922	3
57. Bulls born on or after 1st December 1922	1
58. Cows or heifers, born before 1st December 1921, in milk or in calf; if in calf to calve on or before 1st December of the year of the Show	2
59. Heifers born on or after 1st December 1921	2
60. Heifers born on or after 1st December 1922	2
	— 10

FAT CATTLE.

61. Oxen, any pure breed or cross, born after 1st December 1921	4
62. Oxen, any pure breed or cross, born after 1st December 1922	3
63. Heifers, any pure breed or cross, born after 1st December 1921	3
64. Heifers, any pure breed or cross, born after 1st December 1922	2
	— 12
	406

2. HORSES.

DRAUGHT STALLIONS.

65. Aged stallions	8
66. Three-year-old entire colts	12
67. Two-year-old entire colts	13
68. One-year-old entire colts	22
	— 55

DRAUGHT GELDINGS

69. Aged geldings	11
70. Three-year-old geldings	11
71. Two-year-old geldings	8
	— 30

DRAUGHT MARES AND FILLIES.

72. Mares of any age with foal at foot	13
73. Yeld mares, born before 1921	11
74. Three-year-old yeld mares or fillies	15
75. Two-year-old fillies	11
76. One-year-old fillies	20
	— 70

HUNTERS.

77. Hunter brood mares, with foal at foot	4
78. Yeld mares, fillies, or geldings, born in 1921, in hand	2
79. Yeld mares, fillies, or geldings, born in 1922, in hand	4
80. Colts, geldings, or fillies, born in 1923, the produce of a thoroughbred stallion or registered hunter sire, out of mare of any breed	4
81. Mares or geldings, born in or before 1920, to carry 13 st. and over—in saddle	4
82. Mares or geldings, born in or before 1920, to carry under 13 st.—in saddle	3
Extra Stock	1
	— 22

HACKNEYS.

83. Brood mares, over 14 hands, with foal at foot or to foal this season to a registered sire . . . . .	...
84. Yeld mares or fillies, born in or after 1921	1
85. Stallions born in or before 1921, over 14 hands	1
	— 1

PONIES.

96. Stallions, three years old and upwards, 14 hands and under, in hand	1
97. Yeld mares, fillies, or geldings, three years old and upwards, 14 hands and under, in saddle	3
	— 4

HIGHLAND PONIES.

88. Stallions, born before 1922, not exceeding 14·2 hands	3
Extra Stock	1
89. Mares, born before 1922, not exceeding 14·2 hands, yeld or with foal at foot	16
90. Entire colts, born on or after 1st January 1922	6
91. Fillies born on or after 1st January 1922	1
	— 27

WESTERN ISLAND PONIES.

92. Stallions, born before 1922, not exceeding 14 hands	4
93. Mares, born before 1922, not exceeding 14 hands, yeld or with foal at foot	9
Extra Stock	1
94. Entire colts, born on or after 1st January 1922	2
95. Fillies, born on or after 1st January 1922	1
	— 17

SHETLAND PONIES.

96. Stallions, not exceeding 10½ hands, born before 1921	8
97. Entire colts, not exceeding 10½ hands, born in 1921 or 1922	7
98. Mares, not exceeding 10½ hands, with foal at foot	14
Extra Stock	1
99. Yeld mares, not exceeding 10½ hands	14
100. Fillies, not exceeding 10½ hands, born in 1921 or 1922	7
	— 51

HORSES IN HARNESS.

101. Yeld mares, fillies, or geldings, any age, in harness, 15 hands and upwards, to be driven in the ring	2
102. Yeld mares, fillies, or geldings, any age, in harness, 14 hands and under 15 hands, to be driven in the ring	2
103. Yeld mares, fillies, or geldings, any age, under 14 hands, to be driven in the ring (3)	2
	— 6
	<u>283</u>

JUMPING.

1. Horses or ponies, any height	24
2. Horses or ponies, any height—handicap	22
3. Horses or ponies, any height—handicap	18
4. Horses or ponies, any height	22
	— 86

3. SHEEP.

BLACKFACE.

104. Tups above one shear	21
Extra Stock	2
105. Shearling tups	30
106. Shearling tups—out-wintered	29
107. Ewes above one shear, with lamb at foot	13
Extra Stock	1
108. Shearling ewes or gimmers	22
	— 118

CHEVIOT.

109. Tups above one shear	10
110. Shearling tups	25
111. Ewes above one shear, with lamb at foot	13
112. Shearling ewes or gimmers	15
	— 63

BORDER LEICESTER.

113. Tups above one shear	8
114. Shearling tups	80
115. Ewes above one shear	11
116. Shearling ewes or gimmers	22
	— 71

HALF-BRED.

117. Tups above one shear . . . . .	...
118. Shearling tups	7
119. Ewes above one shear	3
120. Shearling ewes or gimmers	5
121. Three ewe lambs	6
	— 21

OXFORD DOWN.

122. Shearling tups	10
123. Shearling ewes or gimmers	8
124. Tup lambs	13
125. Three ewe lambs	5
	— 36

SUFFOLK.

126. Tups one shear and over	6
127. Shearling ewes or gimmers	8
128. Tup lambs	12
129. Three ewe lambs	6
	— 32

SHROPSHIRE

130. Shearling tups	7
131. Shearling ewes or gimmers	6
	— 13

DORSET HORN.

132. Tups, any age	3
133. Ewes or gimmers	4
	— 7

FAT SHEEP.

134. Three fat lambs, any breed or cross, dropped in the year of the Show	5
	— 5
	366

4. GOATS.

135. Male goats, any variety, over two years	1
Extra Stock	1
136. Male goats, any variety, over one but not exceeding two years	2
137. Male kids, any variety, not exceeding one year	2
138. Female goats, Anglo-Nubian, in milk	1
139. Female goats, any other variety, in milk	7
140. Goatlings, any variety, over one but not exceeding two years	8
141. Female kids, any variety, not exceeding one year	3
142. Milking competition, open to Classes 138 and 139 (animals two years and over) (4)	1
	— 21

5. PIGS.

LARGE WHITE.

143. Boars born before 1923	.	.	.	.	.	.	5
Extra Stock	.	.	.	.	.	.	1
144. Boars born in 1923	.	.	.	.	.	.	10
145. Boars born in 1924	.	.	.	.	.	.	12
146. Sows born before 1923	.	.	.	.	.	.	13
147. Sows born in 1923	.	.	.	.	.	.	9
148. Sows born in 1924	.	.	.	.	.	.	11
							— 61

MIDDLE WHITE.

149. Boars, any age	.	.	.	.	.	.	11
Extra Stock	.	.	.	.	.	.	1
150. Boars born in 1924	.	.	.	.	.	.	10
151. Sows, any age	.	.	.	.	.	.	7
152. Sows born in 1924	.	.	.	.	.	.	15
							— 44

BERKSHIRE.

153. Boars, any age	.	.	.	.	.	.	3
154. Boars born in 1924	.	.	.	.	.	.	...
155. Sows, any age	.	.	.	.	.	.	4
Extra Stock	.	.	.	.	.	.	1
156. Sows born in 1924	.	.	.	.	.	.	1
							— 9

LARGE BLACK.

157. Boars born before 1923	.	.	.	.	.	.	6
158. Boars born in 1923	.	.	.	.	.	.	8
159. Boars born in 1924	.	.	.	.	.	.	9
160. Sows born before 1923	.	.	.	.	.	.	11
161. Sows born in 1923	.	.	.	.	.	.	10
162. Sows born in 1924	.	.	.	.	.	.	12
							— 56

GLOUCESTERSHIRE OLD SPOTS.

163. Boars, any age	.	.	.	.	.	.	...
164. Boars born in 1924	.	.	.	.	.	.	1
165. Sows, any age	.	.	.	.	.	.	1
166. Sows born in 1924	.	.	.	.	.	.	2
							— 4

CUMBERLAND.

167. Boars, any age	.	.	.	.	.	.	7
168. Boars born in 1924	6
169. Sows, any age	9
170. Sows born in 1924	6
							— 28

202

6. POULTRY.

1-118. Poultry.	760
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7. DAIRY PRODUCE.

1. Powdered butter, not less than 8 lb.	14
2. Fresh butter, three 1-lb. rolls	17
3. Cheddar cheese, 56 lb. and upwards	14
4. Sweet-milk cheese, flat shape, white in colour, from a dairy where all cheese is made according to the Dunlop method	3
5. Cheese, 14 lb. and under	11
	— 59

8. BEE APPLIANCES AND HONEY, &c.

OPEN CLASSES—APPLIANCES.

1. Collection of hives and appliances	2
2. Best and most complete standard frame hive for general use, un- painted	3
3. Best and most complete standard frame hive for cottager's use, un- painted	3
4. Any new appliance connected with Bee-keeping to which no prize has been awarded at any previous Highland Show	5
	— 13

HONEY, &c.

5. Six sections of comb honey	14
6. Six jars of run or extracted light-coloured honey, approximate weight 6 lb.	13
7. Six jars of run or extracted medium or dark-coloured honey, excluding heather, approximate weight 6 lb.	7
8. Six jars of pressed heather honey in liquid form, approximate weight 6 lb.	8
9. Six jars of granulated honey, approximate weight 6 lb.	14
10. Two shallow frames of comb honey for extracting purposes	9
11. Products made with the aid of honey	5
12. Best display of honey in any form staged in space 3 feet by 3 feet, height from table not exceeding 4 feet, weight of honey not to exceed 100 lb.	4
13. Best exhibit of not less than 1 lb. of wax in any form	12
14. Best exhibit of not less than 1 lb. of wax made into shape for retail trade and over-counter trade	11
15. Observatory hive with queen and bees	3
	— 100

CONFINED TO SCOTTISH EXHIBITORS.

16. One shallow frame of comb honey for extracting purposes	11
17. Six sections of comb honey	22
18. Six jars of run or extracted medium or dark-coloured honey, exclud- ing heather, approximate weight 6 lb.	11
19. Six jars of run or extracted light-coloured honey, approximate weight 6 lb.	18
	— 62
	— 176

9. WOOL.

PURE BREED CLASSES.

1. Blackface ewe	11
2. Blackface wedder	4
3. Blackface hogg	8
4. Cheviot ewe	7
5. Cheviot hogg	6
6. Border Leicester ewe	4
7. Border Leicester hogg	4
8. Half-bred ewe	5
9. Half-bred hogg	5
10. Shetland ewe	6
11. Shetland hogg	5
	<hr/> 65

10. RURAL INDUSTRIES.

1-23	<hr/> 422
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11. HORSE-SHOEING.

1 and 2	68
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ABSTRACT.

	No. of Entries.
1. Cattle	406
2. Horses	283
3. Sheep	366
4. Goats	21
5. Pigs	202
6. Poultry	760
7. Dairy Produce	59
8. Bee Appliances and Honey, &c.	175
9. Wool	65
10. Rural Industries	422
11. Horse-Shoeing	68
	<hr/> 2827

The following table gives a comparative view of the entries of cattle, horses, sheep, pigs, poultry, dairy produce, bee appliances and honey, wool, &c., and implements, of the value of the premiums offered, and of the receipts at the entrance-gates, grand stands, and for catalogues at the Shows which have been held in the Perth Show District :—

Year.	Cattle.	Horses.	Sheep.	Goats.	Pigs.	Poultry.	Dairy Produce.	Bee Appliances, &c.	Wool.	Rural Industries.	Horse-Shoeing Competition.	Implementa.	Framlams.	Drawings at Show.
1829 .	192	53	78	...	13	...	...	...	...	...	...	14	£357	£119
1836 .	265	46	156	...	16	...	6	...	...	...	...	17	479	225
1843 .	317	73	129	...	21	17	31	...	...	...	...	101	990	900
1852 .	313	135	250	...	42	93	123	...	...	...	...	339	900	928
1861 .	335	155	271	...	52	120	91	...	...	...	...	850	1500	1,328
1871 .	376	177	300	...	43	225	88	...	...	...	...	1948	1600	2,270
1879 .	383	253	220	...	40	157	49	...	11	...	...	2207	2629	3,068
1887 .	...	239	311	...	26	210	72	...	...	...	...	1509	2372	1,841
1896 .	292	258	204	...	20	374	45	...	...	...	13	1945	2205	4,788
1904 .	348	315	233	...	35	413	46	...	...	...	...	1972	3058	4,998
1912 .	294	348	255	...	81	548	58	...	...	...	43	1801	3310	3,580
1924 .	406	283	366	21	202	760	59	175	65	422	68	2382	5712	10,758

A COMPARISON.

The following figures relating to some of the most successful Shows the Society has held will be perused with interest :—

	Cattle.	Horses.	Sheep.	Pigs.	Poultry.	Total Live Stock.	Implementa.	Premi-ums.	Drawings at Show.	Profit.
Glasgow, 1867 .	286	212	257	58	150	963	1344	£1600	£3,005	£1807
Edinburgh, 1869 .	310	212	340	22	239	1123	1900	1600	4,078	2067
Glasgow, 1875 .	411	405	296	48	479	1639	2220	2665	6,231	3316
Edinburgh, 1877 .	339	342	305	30	234	1250	2292	2714	6,734	3710
Edinburgh, 1884 .	580	453	493	35	253	1814	2282	4343	6,548	1855
Edinburgh, 1893 .	380	349	294	31	360	1414	2268	2600	4,918	2323
Aberdeen, 1894 .	314	324	184	34	365	1221	2532	2440	5,121	1678
Perth, 1896 .	292	258	204	20	374	1148	1945	2205	4,788	2511
Glasgow, 1897 .	317	350	245	30	275	1217	2227	2897	4,392	2021
Edinburgh, 1899 .	366	518	477	46	551	1978	2585	3844	10,285	3911
Stirling, 1900 .	321	288	369	28	457	1463	2095	2915	4,305	1078
Inverness, 1901 .	360	257	204	22	499	1340	1460	2806	2,485	99
Aberdeen, 1902 .	330	253	243	42	475	1343	1988	2796	4,413	1604
Perth, 1904 .	348	315	283	35	413	1394	1972	3058	4,993	1828
Glasgow, 1905 .	310	462	284	60	534	1750	1875	3702	4,473	1203
Peebles, 1906 .	253	258	291	40	438	1280	1658	3072	2,596	416
Edinburgh, 1907 .	363	464	352	58	605	1842	2140	3614	7,061	2309
Aberdeen, 1908 .	331	299	237	42	509	1418	1931	3045	4,596	1881
Stirling, 1909 .	330	355	249	54	539	1527	1977	3017	4,638	1100
Dumfries, 1910 .	270	355	295	54	481	1455	1950	3057	3,411	562
Paisley, 1913 .	408	472	334	48	536	1798	1968	5109	6,468	2527
Edinburgh, 1919 .	215	301	221	43	393	1238	1605	4517	17,377	3275
Aberdeen, 1920 .	340	250	279	112	597	1597	2065	4608	14,120	1679
Stirling, 1921 .	367	279	299	188	582	1774	2201	5055	12,822	2350
Dumfries, 1922 .	422	272	339	229	588	1891	2156	5488	11,428	1090

CATTLE.

The entries in the cattle section totalled 406, a slight decrease from last year. In addition to this decrease, a larger

number than usual of animals entered were not forward, this being accounted for, in some cases, by fear of difficulty in getting animals returned from the Show on account of foot-and-mouth disease restrictions.

There was a good exhibit of Shorthorns, the entries numbering 94. The President's Champion Medal was won by Mr Finlay MacGillivray, Aldie, Tain, with "Calrossie White Prince," 197,192 (Fig. 38), a handsome white two-year-old bull bred by Captain John MacGillivray of Calrossie, Nigg, Ross-shire, and got by "White Prince," 168,014, out of "Una Undine." This animal, which was Reserve Champion at Inverness last year, was also awarded the Fife and Kinross Perpetual Gold Challenge Cup and the Shorthorn Society's prize of £20 for the best bull. The runner-up for Championship honours was the beautiful roan five-year-old cow "Bellona Girl," 2908, bred and exhibited by Captain A. N. Talbot Fletcher of Saltoun, Pencaitland, and got by "Newton Renown," 121,779, out of "Rosabel 10th." This animal won the Shorthorn Society's prize of £20 for the best female, and was also awarded the Duthie Perpetual Challenge Cup, for which "Calrossie White Prince" was not eligible, having won it last year.

The Dairy Shorthorn Classes were cancelled on account of insufficient entries.

An extremely good display of Aberdeen-Angus cattle was provided, the entries reaching a total of 105, the largest in the cattle section. After keen competition, the President's Champion Medal was awarded to Sir George Macpherson Grant, Bart., of Ballindalloch, for "Evelusive of Ballindalloch," 67,167 (Fig. 39), a five-year-old home-bred cow of good substance and with a nice head. Her sire was "Elorus of Ballindalloch," 41,330, and dam "Evilextra," 60,299. In addition to the Championship, this animal secured the Aberdeen-Angus Cattle Society's Champion Gold Medal and the Ballindalloch Challenge Cup for the best cow. The Ballindalloch Challenge Cup for the best bull was won by "Boxer of Ballindalloch," 47,409, the property of Sir John R. Findlay, K.B.E., of Aberlour, and bred by Sir George Macpherson Grant, Bart.

Galloways were more numerous than last year, there being an entry of 41, with few absentees. Mr Robert Graham, Chapel of Logan, Canonbie, secured the President's Champion Medal, and also the Dr Gillespie Memorial Challenge Trophy, with "Logan Lady 5th," 26,463 (Fig. 40), an attractive six-year-old cow bred by Exhibitor, and got by "Owen of Barlae," 12,498, out of "Logan Lady 2nd," 22,648.

There was a good show of Highland cattle, although the number forward was only moderate. The President's Champion Medal was again awarded to the Duke of Atholl, K.T., Blair Castle, Blair Atholl, for "Iarla Buidhe of Atholl" (Fig.

41), which animal won the same honour last year. This is a fine quality two-year-old bull bred by Exhibitor, and got by "Alasdair Ruadh of Farr," 3036, out of "Bean Bhan IX. of Atholl." It was also awarded the Highland Cattle Society's Perpetual Victory Challenge Cup for the best bull, the corresponding cup for the best female going to the Earl of Southesk, Kinnaird Castle, Brechin, for his three-year-old heifer, "Princess Maura VIII."

The entry of Ayrshires was disappointing, the number catalogued being 39, of which 30 were forward, but the quality of the exhibits was up to the usual high standard. Mr James Howie, Hillhouse, Kilmarnock, was successful in securing the President's Champion Medal, the Cowhill Champion Cup, and the Ayrshire Cattle Herd-Book Society's Special Prize of £10 for the best bull with "Hobsland Duplicate," 22,581 (Fig. 42). This handsome two-year-old bull was bred by Mr Thomas Barr, Hobsland, Monkton, his sire being "Hobsland Lucky Boy," 16,482, and dam, "Hobsland Lovely 5th," 51,072. The reserve for Championship honours and winner of the Ayrshire Cattle Herd-Book Society's Special Prize of £10 for the best female was "Edingham Belinda," 54,337, a nine-year-old cow belonging to Mr William L. Ferguson, Catlinns, Lockerbie.

British Friesians had an entry of 55, and gave a highly creditable display. The Championship went to the Trustees of Sir Alasdair W. MacRobert, Bart., Douneside Home Farm, Tarland, for "Lochlands Maris," 47,020 (Fig. 43), a stylish four-year-old cow bred by Mr Adam Smith, Lochlands, Larbert, sired by "Lochlands Carron," 8257, and dam, "Stanfield Molly," 3808. This animal also won the British Friesian Cattle Society's Champion Prize for the best female, the corresponding prize for the best male going to Mr David Sinclair, Loirston, Nigg, Aberdeen, for "Loirston Albert," 17,795.

Red Poll entries were adversely affected by foot-and-mouth disease restrictions, and only 8 animals were forward out of an entry of 13. The quality of the exhibits, however, was highly meritorious. The President's Champion Medal and the Kinmount Challenge Cup were won by Miss Crum Ewing, Strathleven, Dumbarton, with "Ashmoor Million," 28,465 (Fig. 44), a handsome four-year-old cow bred by Mr A. Carlyle Smith, Sutton Hall, Woodbridge, Suffolk, and got by "Ashmoor Pearson," 11,525, out of "Ashmoor Money," 22,904.

Only 5 Belted Galloways were shown, these all being the property of Mr Robert Graham, Auchengassel, Twynholm, who was awarded the President's Champion Medal and the Knockbrex Challenge Cup for his three-year-old home-bred cow "Mark Polly," 219 B, (Fig. 45), sire "Mark Champion," 55 B, dam "Mark Fanny," 211 B.

There was a small but useful exhibit of Fat Cattle. The Championship was awarded to Mr Andrew Thomson Reid of Auchterarder House, Auchterarder, for his two-year-old home-bred Aberdeen-Angus ox, "Black Blank of Auchterarder," 51,876 (Fig. 46).

HORSES.

Draught Horses showed a gratifying increase in numbers compared with last year, and, as usual, this section provided one of the outstanding features of the Show.

After a keen competition the President's Champion Medal for the best Clydesdale stallion or colt was awarded to Mr Andrew M. Montgomery of Nether Hall, Castle-Douglas, for a beautiful bay yearling colt (unnamed) (Fig. 47), bred by Mr John P. Sleigh of St John's Wells, Fyvie, his sire being "Dunure Footprint," 15,203, and dam "Wells Nona," 54,072.

Draught Geldings, especially in the aged class, made an extremely fine show. The Champion was found in the four-year-old bay gelding "Harry" (Fig. 48), owned by Mr John P. Sleigh of St John's Wells, Fyvie, bred by Mr John Meikle, Anchor's Cross, Dunblane, and sired by "Pride of Methlick," 18,866.

The best display in the Draught section was that provided by the mares and fillies. The classes were well filled, and the prize-winners showed special merit. After a spirited contest Mr James Kilpatrick, Craigie Mains, Kilmarnock, carried off the President's Champion Medal and the Cawdor Challenge Cup with "Craigie Ella" (Fig. 49), a lovely brown two-year-old filly got by "Craigie Litigant," 19,071, out of "Abercrombie Emma," 47,287. This filly was bred by Mr James Cairns, Abercrombie, St Monance, who accordingly secured the William Taylor Memorial prize and certificate.

The Hunter classes were only moderately filled. The President's Champion Medal was won by Mr John M. Allison, Overton, Kirkliston, with "Haig" (Fig. 50), a seven-year-old bay gelding bred by Miss Thompson, Glenpark, Balerno, and got by "Sailor Lad."

In the Hackney section only one animal was exhibited. This was "Baron Shaw," 13,823 (Fig. 51), a five-year-old chestnut stallion the property of and bred by Mr Neil M. Shaw, Commercial Hotel, Portpatrick, who accordingly secured the President's Medal for best Hackney. The President's Medal for the best pony went to Mr J. E. Kerr of Harviestoun, Dollar, for his three-year-old brown stallion "Sir Andra," 14,205 (Fig. 52), bred by exhibitor, sire "Southworth Swell," 11,219, and dam "Harviestoun Reina," 24,965.

The number of entries in the Highland Pony classes was

nearly equal to the gratifying total of last year, and many fine animals were on view. The President's Champion Medal was awarded to the Board of Agriculture for Scotland for their aged black stallion "Macpherson," 735 (Fig. 53), bred by Mr Thomas M'Kay, South Duntulm, Skye, and sired by "Athol."

Although the entries in the classes for Western Island Ponies were small, the quality of the exhibits forward was satisfactory. Mr James N. Cairns, Ardlarch House, Isle of Luing, secured the President's Champion Medal with "Noss Lassie," 4776 (Fig. 54), a nice three-year-old dark grey mare, by "Highland Moss," 388, out of "Glencrichty," 4042.

One of the most attractive sections in the Showyard was that provided by the Shetland Ponies. Each of the five classes was well filled, and the quality of the animals forward was exceptionally high. After keen competition the President's Champion Medal and the Renfrewshire Perpetual Gold Challenge Cup were won by "Dibblitz of Penniwells" (Fig. 55), a sturdy four-year-old black stallion the property of and bred by Mrs Etta Duffus, Penniwells, Elstree, Herts, and got by "Blitz," 848, out of "Diddy," 2193.

The entries in the classes for Horses in Harness were disappointingly small. The winner of the President's Champion Medal was Mr William S. Miller, Balmanno Castle, Bridge of Earn, with his well-known four-year-old brown mare "Stella Vane," 25,386 (Fig. 56). Bred by Mr J. Bellingham, The Limes, Old Hill, Staffs, she was got by "Mathias," 6493, out of "Polly Vane," 18,500.

More competitors than usual took part in the Jumping Competitions, which proved highly attractive.

SHEEP, PIGS, &c.

The Sheep classes were well filled, the entries reaching a total of 366, which compares with 272 at Inverness the previous year. There was a large entry of Pigs, but, as already stated, many were unable to be exhibited owing to foot-and-mouth disease restrictions. The classes for Goats did not attract many entries. The winners of the President's Champion Medals are shown in Figs. 57-70.

Poultry, Dairy Produce, Bee Appliances and Honey, Wool, and Rural Industries Sections were well supported with entries, and the quality of the various exhibits was up to the usual high standard.

Great interest was taken in the Horse-Shoeing Competitions, and the manner in which the competitors carried out their work, especially in the junior class, was highly meritorious.

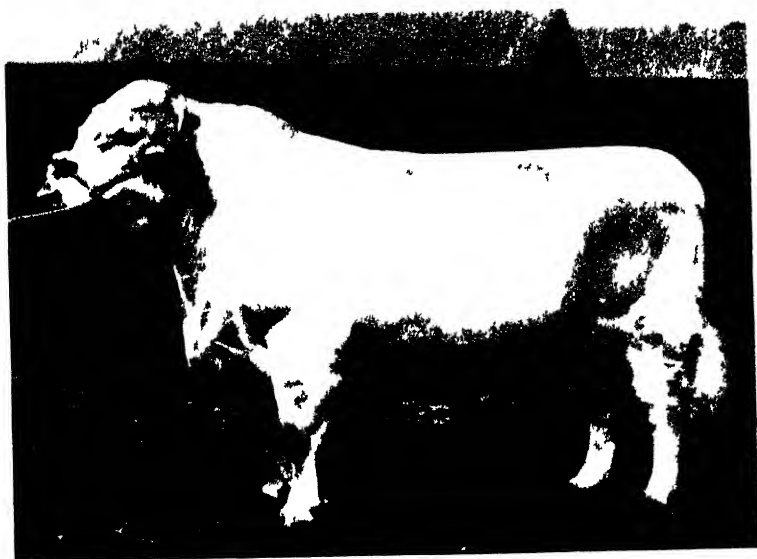


Fig 38 —SHORTHORN BULL, "CAIROSSIE WHITE PRINCE" 197,192
 Winner of President's Medal for best Shorthorn Bull Show 1924. The property of Mr
 John MacCulloch, Alloa, Tain Ross-shire. Bred by Captain John MacCulloch of
 Cairrossie, N. Ross-shire. Age two years and three months.

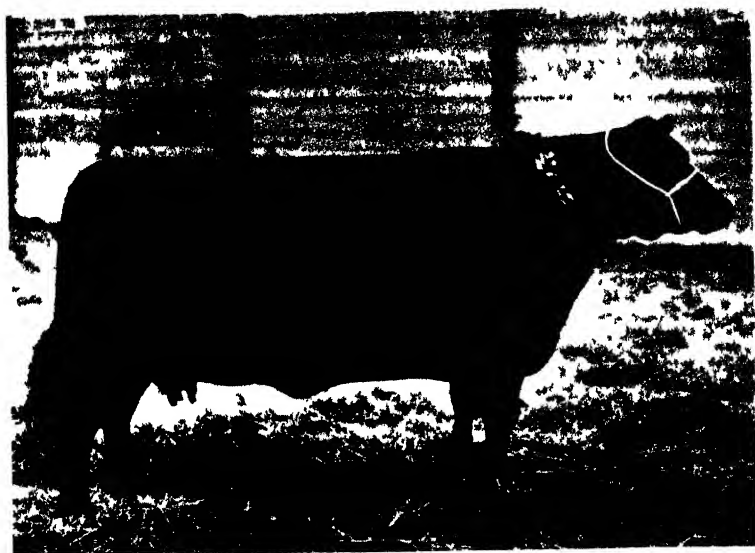


Fig 39 —ABERDEEN ANGUS COW, "LIVEUSE OF BALLINDALLOCH" 67,167
 Winner of President's Medal for best Aberdeen Angus animal Perth Show 1924. Bred by
 and the property of Sir George Macpherson Grant, Birt Castle Ballindalloch,
 Birmouth. Age four years and seven months.



GALLOWAY COW, "TO AN LADY" AGE 16

Winner of President's Medal for best Galloway 1st Show 1914 Bred by and the property of Mr Robert Graham Chiswick Hill Market Cambridgeshire Age six years and three months

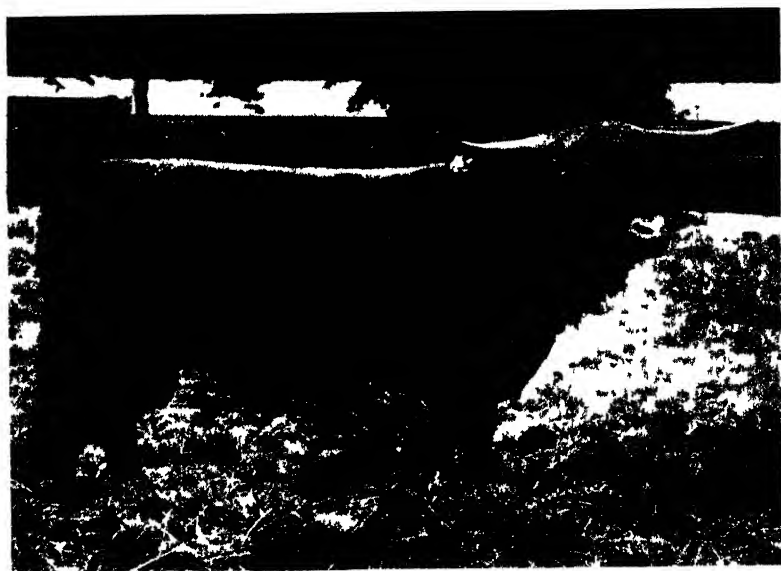


Fig 41 - HIGHLAND BULL, "IARNA BUIDHE OF ATHOLL"

Winner of President's Medal for best Highland animal Perth Show 1924 Bred by and the property of The Duke of Atholl K T, Blair Castle Blair Atholl Age two years and six months

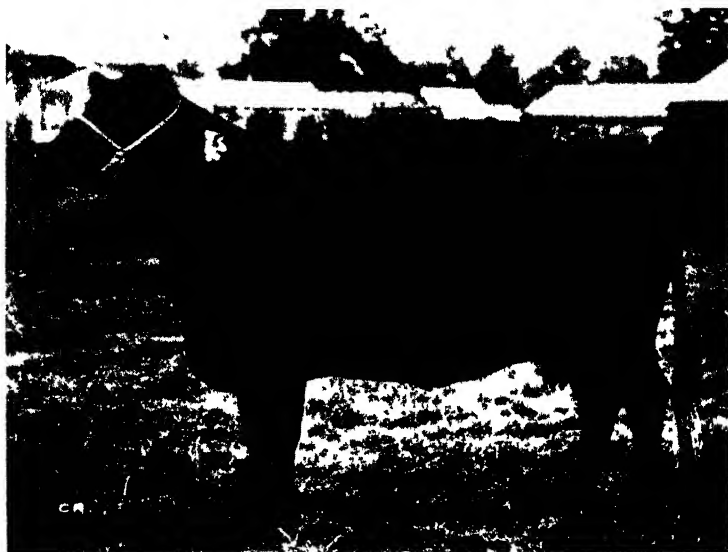


Fig. 44 — RED POLL COW, "ASHMOOR MILKON" 28465

Winner of President's Medal for best Red Poll fourth Show, 1924. The property of Miss Crampton, Strathleven, Dunfermline. Bred by Mr. A. Culyl Smith, Sutton Hall, Wotton, Suffolk. Age three years and eight months.



Fig. 45 — BELIED GALLOWAY COW, "MARK POLLY" 219 B.

Winner of President's Medal for best Belted Galloway animal, Perth Show, 1924. Bred by and the property of Mr. Robert Graham, Auchergassel, Twynholm. Age three years and one month.



Fig. 46. ABERDEEN ANGUS ON "BLACK BLANK OF AUCHTERAUDE" 51,876

Winner of President's Medal for best Fat animal, Perth Show, 1924. Bred by and the property of Mr. Andrew Thomson, Reel of Auchteraunder House, Auchteraunder. Age two years and six months.

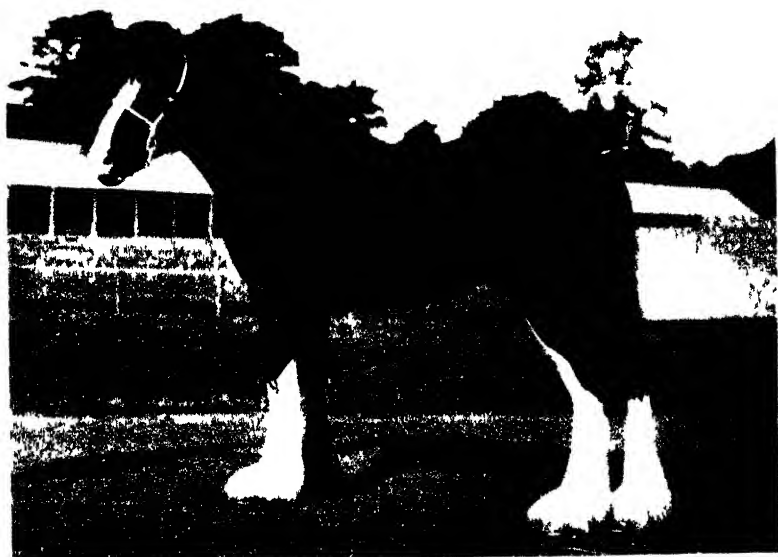


Fig. 47.—CLYDESDALE COLT

Winner of President's Medal for best Clydesdale Stallion or Colt, Perth Show, 1924. The property of Mr. Andrew M. Montgomery of Nether Hall, Castle Douglas. Bred by Mr. John P. Sleight of St. John's Wells, Tain. Age one year and two months.

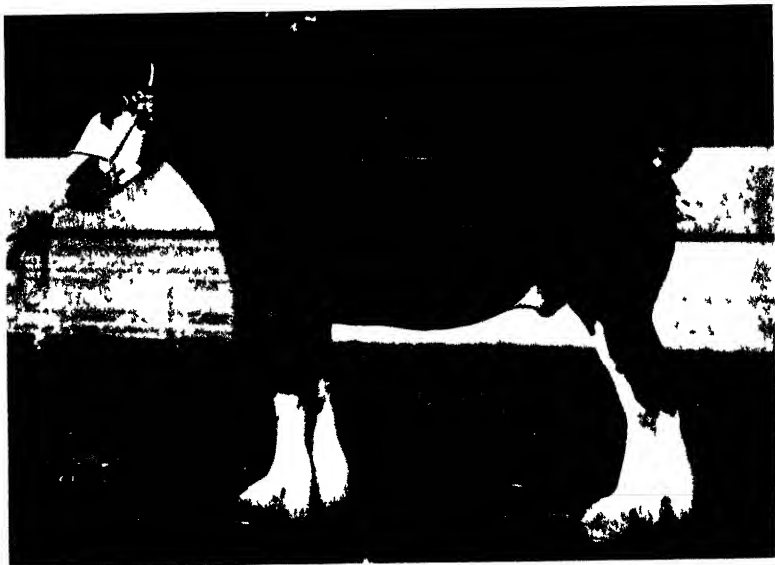


Fig. 48 — DRAUGHT GELDING, "HARRY"

Winner of President's Medal for best Draught Gelding, Perth Show, 1924. The property of Mr John P. Sleight of St John's Well, Lymm. Bred by Mr John Meek, Anchor's Cross, Dunblane. Age four years.



Fig. 49 — CLYDESDALE FILLY, "CRAIGIE LILLA"

Winner of President's Medal for best Clydesdale Mare or Filly, Perth Show, 1924. The property of Mr James Kilpatrick, Craigie Muns, Kilmarnock. Bred by Mr James Cairns, Abercrombie, St Monance. Age two years.

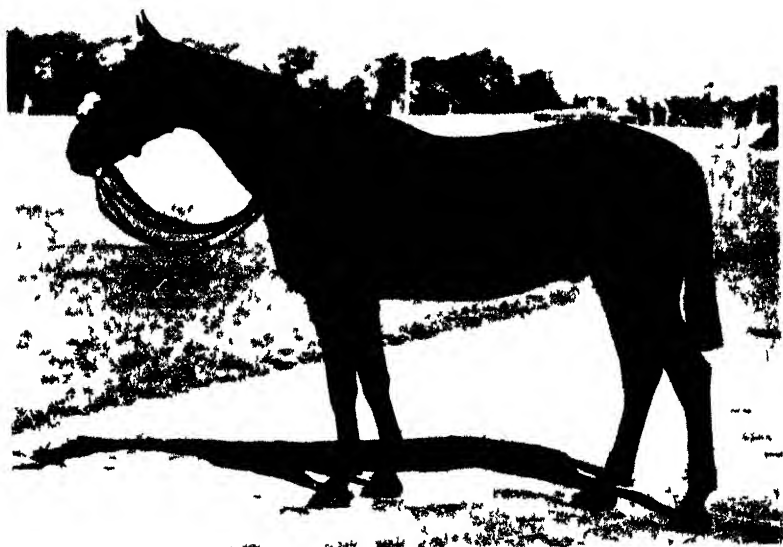


Fig 0 HUNTER GILDING, HAI

Winner of President's Medal for best Hunter at the Portland Show 1914. The property of Mr J. H. M. Allen, of the Kentish. Bred by Mrs. D. J. Glenpark, Balm. Age six years and ten months.

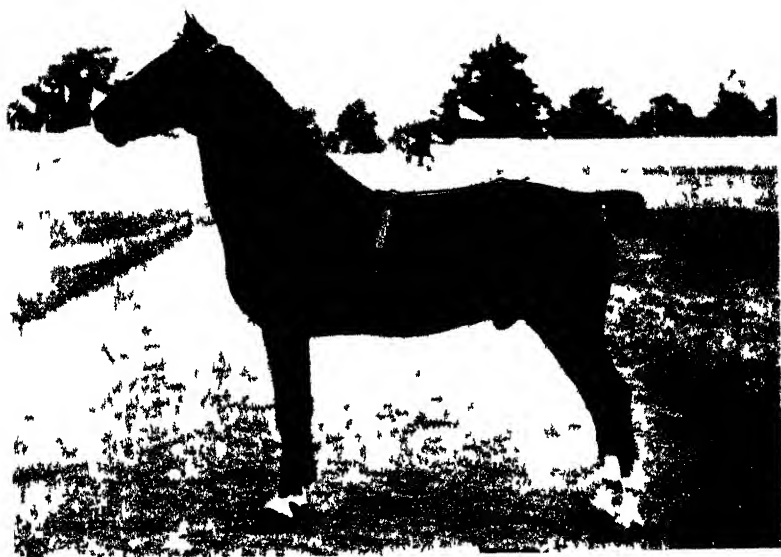


Fig 51 HACKNEY STALLION BARON SHAW 13823

Winner of President's Medal for best Hackney at the Portland Show 1924. Bred by and the property of Mr N. M. Shaw, Commercial Hotel, Portland. Age five years and two months.

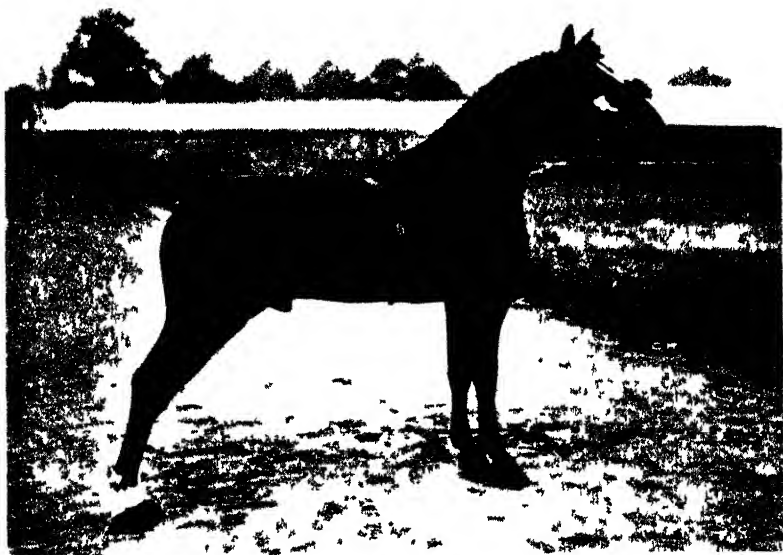


Fig 52 —PONY STALLION — SIR ANERA 14.205

Winner of President's Medal for 1st Pony, Perth Show 1924. Bred by and property of Mr J. E. Keir, 1 Harrow Hill, Dundee. Age thirteen and a half years.



Fig 5 —HIGHLAND PONY STALLION, —MACHESON 7.

Winner of President's Medal for 1st Highland Pony, Perth Show 1924. The property of the Board of Agriculture for Scotland. Bred by Mr Thomas McKay, South Duntulm, Skye. Age thirteen years.



Fig. 4.—WESTERN ISLAND PONY MARE—NOSS LASSIE—1776

Winner of President's Medal for Best Western Island Pony, Perth Show, 1924. Bred by and the property of Mr. James N. Cairns, Ardlurch House, Isle of Tuing, Argyllshire. Age three years.



Fig. 5.—SHEPHERD PONY STALLION—'DUMBELL OF PENNIWELLS

Winner of President's Medal for Best Shepherd Pony, Perth Show, 1924. Bred by and the property of Mrs. E. McDunn, Penniwells, Elstie, Perth. Age four years and two months.



FIGURE 1.—YETI MALLIN HARNISS, STELLA VANE 25 386
 Winner of President's Medal for Best Harness Race, Perth Show 1924. The property of Mr William S. Miller.
 Bred by Mr J. B. H. in Van, the Times, Old Hill, Stads, A. Five Acres

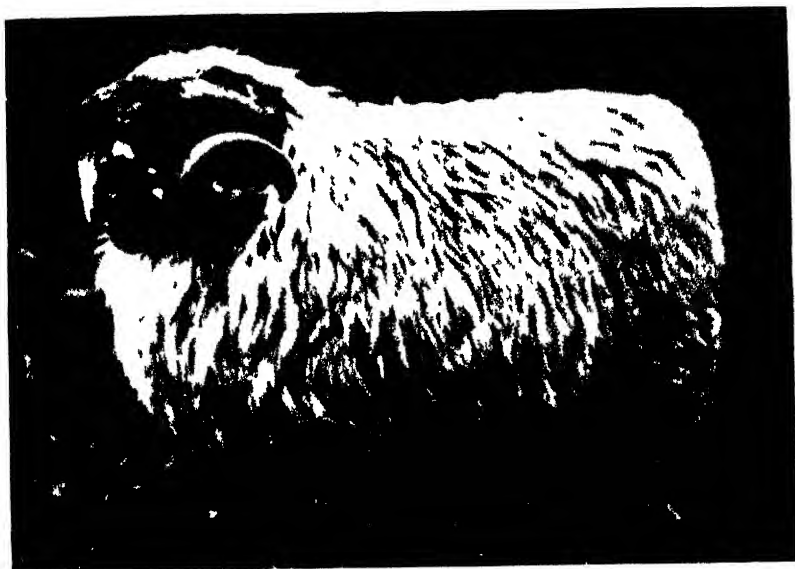


Fig. 57 — BLACKFACE TUI, 'MASTERKIEFF'

Winner of President's Medal for best Blackface, Perth Show, 1921. Bred by and the property of Mr Charles Cudzow, Weston, Dunshire. Age four sheep.



Fig. 58 — CHEVIOT EWE.

Winner of President's Medal for best Cheviot, Perth Show, 1924. Bred by and the property of Mr John Elliot, Blackhaugh, Cleevefords. Age two sheep.



Fig. 59 — BORDER LEICESTER EWE

Winner of President's Medal for best Border Leicester Ewe. Perth Show 1924. Bred by and the property of Mr. Alexander Nisbet, Ayr, Newburgh, Fife. Age, five years.

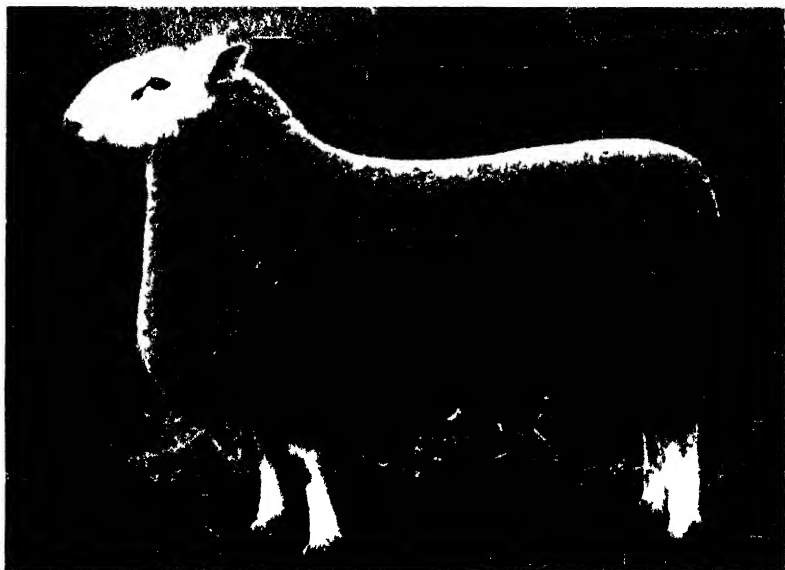


Fig. 60 — HALF-BRED SHEARING TUG

Winner of President's Medal for best Half-bred. Perth Show 1924. Bred by and the property of Mr. A. Iain Hogg, Duncanlaw, Gifford.

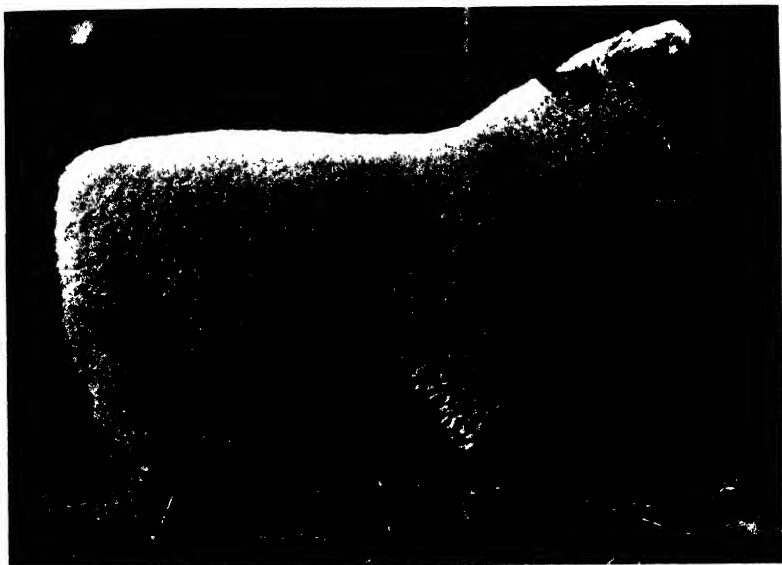


Fig. 61.—OXFORD-DOWN SHEARLING TUP.

Winner of President's Medal for best Oxford-Down, Perth Show, 1924. Bred by and the property of Messrs T. & M. Templeton, Sandyknowe, Kelso.

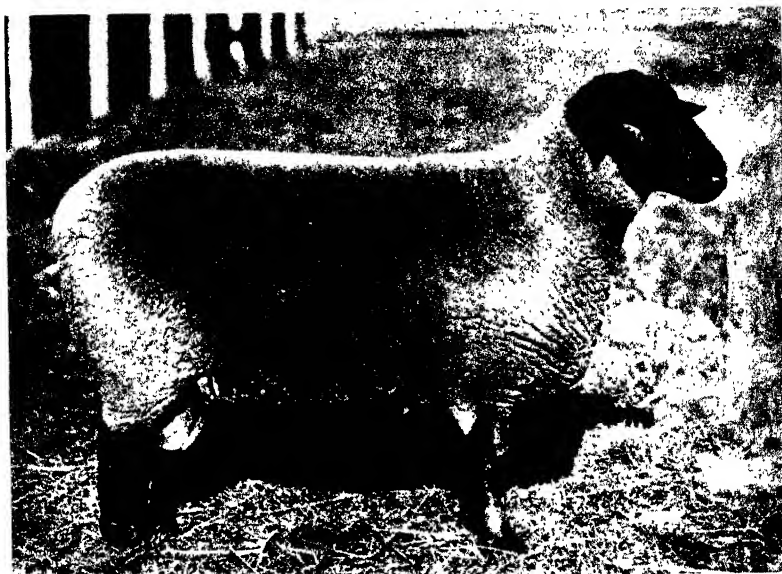


Fig. 62.—SUFFOLK SHEARLING TUP, "HAWK EAGLE."

Winner of President's Medal for best Suffolk, Perth Show, 1924. The property of Mr John Bryce Duncan, Newlands, Dumfries. Bred by Messrs J. W. & F. D. Eagle, The Hall, Walton-on-Naze.

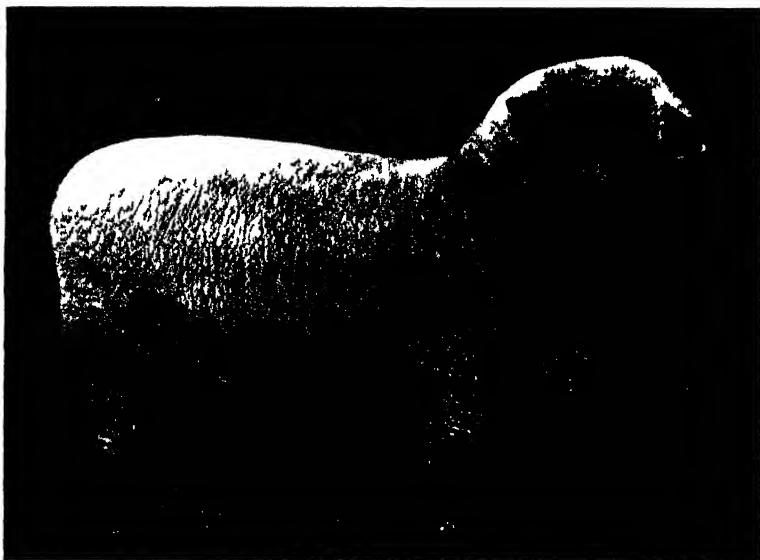


Fig. 63 — SHROPSHIRE SHEARLING

Winner of President's Medal for 1st Shropshire Fleece Show 1914. Bred by and the property of Mr H. J. A. Butler, Colton, Co. Llanidloes.

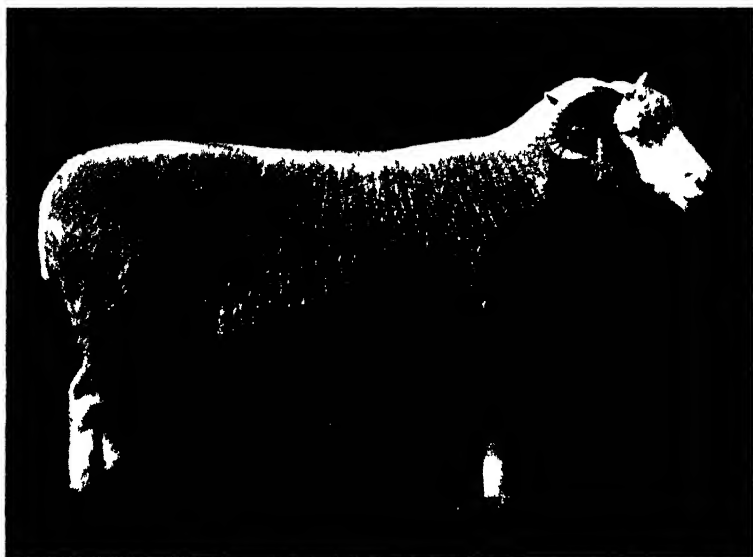


Fig. 64 — DORSET HORN EWES

Winner of President's Medal for 1st Dorset Horn Perth Show 1924. Bred by and the property of The Earl of Elgin and Kincardine. C. M. G. Broomhall, Dunfermline. Age three shear.

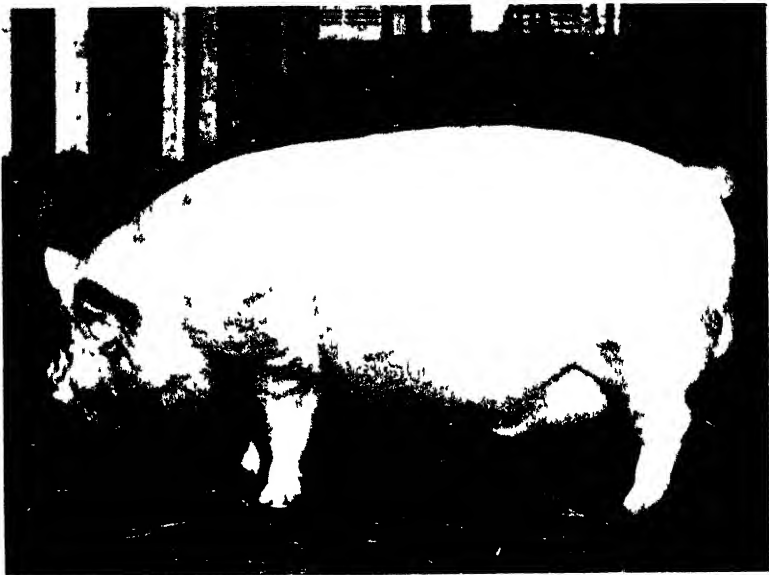


Fig 67.—MIDDLE WHITE BOAR, 'MIDDELIAN REVELER'.

Winner of President's Medal for best Middle White Pig, Perth Show, 1921. Bred by and the property of The Earl of Rothes, K.G., K.L., Dalmeny House, Edinburgh. Age one year and four months.

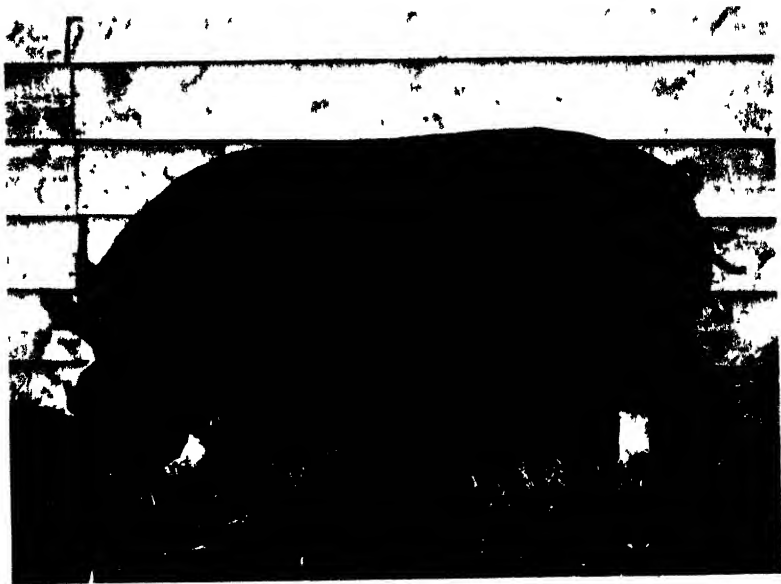


Fig 68.—BERKSHIRE SOW, "CHARM" S 866.

Winner of President's Medal for best Berkshire Pig, Perth Show, 1921. The property of Mr A. Henderson Bishop, Thornton Hall Home Farm, Thorntonhall Station, Glasgow. Bred by Mr M. J. Day, Bungay, Dorset. Age two years and three months.



Fig 69 —LARGE BLACK SOW, "NEWACRE DAFFODIL 1ST" 127,096

Winner of President's Medal for best Large Black Pig, Perth Show, 1924 Bred by and the property of Mr John Bryce Duncan, Newlands, Dumfries Age eleven months



Fig 70—GLOUCESTERSHIRE OLD SPOTS SOW, 'NASH'S BLOSSOM 131H' 17,727

Winner of President's Medal for best Gloucestershire Old Spots Pig Perth Show, 1921. The property of Messrs Samuel & Reginald Bundall Hotel Stanley, Perthshire. Bred by Messrs Sherriff & Sons, Lemsford, Hatfield. Age one year and five months.

PREMIUMS AWARDED BY THE SOCIETY IN 1924.

I.—PERTH SHOW,

15th, 16th, 17th, and 18th July 1924.

ABBREVIATIONS.—V., *Very Highly Commended.* H., *Highly Commended.*
C., *Commended.*

CATTLE SHORTHORN.

PRESIDENT'S CHAMPION MEDAL for Best Shorthorn.

No. 17 MacGillivray, Finlay, Aldie, Tain, Ross-shire, "Calrossie White Prince" (197,192).

Reserve—No. 46 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Bellona Girl" (2908).

Fife and Kinross Perpetual Gold Challenge Cup, value £200, *for best Shorthorn animal, "Extra Stock" being eligible to compete.* This Cup, along with an endowment of £400, was subscribed for by the Counties of Fife and Kinross in commemoration of the Society's first Show at Cupar-Fife in 1912.

No. 17 MacGillivray, Finlay, Aldie, Tain, Ross-shire, "Calrossie White Prince". (197,192).

Reserve—No. 46 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Bellona Girl" (2908).

The Duthie Perpetual Challenge Cup, value £150, *for best animal in the Shorthorn Classes, "Extra Stock" being eligible to compete.* This Cup was gifted by the late Mr William Duthie, Collynie.

No. 46 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Bellona Girl" (2908).

Best Shorthorn Bull in the Show, entered or eligible for entry in Coates's Herd-Book—£20, given by the Shorthorn Society.

No. 17 MacGillivray, Finlay, Aldie, Tain, Ross-shire, "Calrossie White Prince" (197,192).

Silver Medal to the Breeder of the winner of above Prize—given by the Shorthorn Society.

No. 17 MacGillivray, Captain John, of Calrossie, Nigg, Ross-shire.

Breeder of best Bull of any age in Classes 1, 2, 3, 4, and 5—The Silver Medal.

No. 17 MacGillivray, Captain John, of Calrossie, Nigg, Ross-shire.

CLASS 1. BULL, born before 1st December, 1921.—
Premiums, £15, £10, £5, and £3.

- 1st No. 2 Macintyre, Captain A. M., of St. Martin's, Conon Bridge, Ross-shire,
"Balnakyle Secret" (153,700).
2nd No. 9 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Lothian Alert" (165,000).
3rd No. 6 Pitcaithly, George, West Dron, Bridge of Earn, "Strike Sure"
(167,360).
4th No. 8 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Balcairn General" (146,863).
V No. 5 Niven, William S., Loan of Errol, Errol, "Garbity Royal Flush"
(171,821).
O No. 4 Morison, Ian K., Melginch, Balbeggie, Perthshire, "Memento"
(174,047).

CLASS 2. BULL, born on or after 1st December, 1921, and before 1st April,
1922.—Premiums, £15, £10, £5, and £3.

- 1st No. 12 Kirk, Thomas, of Abbey Mains, Haddington, "Rothas Regent"
(184,668).
2nd No. 13 MacGillivray, William, Bruiack, Beauly, "Calrossie Royal King"
(179,189).
3rd No. 14 Malcolm, William T., Whittingehame Mains, Prestonkirk, East
Lothian, "Proud Cavalier" (184,088).
4th No. 10 Alexander & Addie, Newbiggin, Cambus, Stirling, "Calrossie Proud
Rosebud" (179,185).

CLASS 3. BULL, born on or after 1st April, 1922, and not later than 30th
November, 1922.—Premiums, £12, £8, £4, and £2.

- 1st No. 17 MacGillivray, Finlay, Aldie, Tain, Ross-shire, "Calrossie White
Prince" (197,192).
2nd No. 16 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencait-
land, East Lothian, "Burnhouse Lex" (179,052).
3rd No. 18 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Lothian Marmaduke" (182,767).

CLASS 4. BULL, born on or after 1st December, 1922, and not later than
31st March, 1923.—Premiums, £12, £8, £4, and £2.

- 1st No. 27 Moray, The Earl of, Doune Lodge, Doune, "Calrossie Clipper
Captivator."
2nd No. 23 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencait-
land, East Lothian, "Startforth Royalist."
3rd No. 26 Kirk, Thomas, of Abbey Mains, Haddington, "Abbey Mains Accor-
der."
4th No. 28 Stewart, Duncan M., Millhills, Crieff, "Rob of Millhills."
V No. 22 Fenwick, Colonel H. T., Stenigot, Louth, "Collynie Nestor."

The Emilio R. Casares, jun., "Junior Champion Challenge Cup," value £50,
for best Shorthorn Bull in Class 5, calved on or after 1st April of the year
preceding the Show, that has passed the tuberculin test. Given by Mr
Emilio R. Casares, jun., London.

No. 33 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland,
East Lothian, "Saltoun Cruiser."

Reserve—No. 35 Gill, W. H., Tomich, Invergordon, "Calrossie Captain
Augusta."

CLASS 5. BULL, born on or after 1st April, 1923.—
Premiums, £10, £6, £4, and £2.

- 1st No 33 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencait-
land, East Lothian, "Saltoun Cruiser."

- 2nd No. 41 Moubray, John J., of Naemoor, Rumbling Bridge, "Naemoor Gaffer."
 3rd No. 35 Gill, W. H., Tomich, Invergordon, "Calrossie Captain Augusta."
 4th No. 43 Stewart, Duncan M., Millhills, Crieff, "Millhills Golden King."
 V No. 42 Niven, William S., Loan of Errol, Errol, "Loan Fusilier."
 C No. 30 Buttar, Thomas A., Corston, Coupar-Angus, "Everest."
 C No. 31 Davidson, Miss E. M., of Cantray, Gollanfield, "Calrossie Liaison Officer."
 C No. 38 Hill, Robert Wylie, of Balthayock, Perth, "Cluny Augustus Royal."

Best Shorthorn Female in the Show, entered or eligible for entry in Coates's Herd-Book—£20, given by the Shorthorn Society.

- No. 46 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Bellona Girl" (2908).

Silver Medal to the Breeder of the winner of the above Prize—given by the Shorthorn Society.

- No. 46 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian.

CLASS 6. COW, born before 1st December, 1921, in Milk.—
 Premiums, £12, £8, £4, and £2.

- 1st No. 46 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Bellona Girl" (2908).
 2nd No. 49 Malcolm, William T., Whittingehame Mains, Prestonkirk, "Queen Pearl" (8432).
 3rd No. 50 Moubray, John J., of Naemoor, Rumbling Bridge, "Princess Viola."
 4th No. 47 Graham, A. G. Maxtone, Redgorton, Perth, "Crocus Dewdrop."
 V No. 45 Crawford and Balcarres, The Earl of, K.T., Balcarres, Colinsburgh, Fife, "Lady Henrietta" (22,741).
 H No. 51 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Lothian Martha 2nd" (7381).
 C No. 44 Buttar, Thomas A., Corston, Coupar-Angus, "Primrose 18th" (11,061).

CLASS 7. COW or HEIFER, born on or after 1st December, 1921.—
 Premiums, £10, £5, £3, and £2.

- 1st No. 53 Butters, James, Masterton, Dunfermline, Heifer, "Masterton Nonpareil 2nd" (34,229).
 2nd No. 56 Fletcher, James Douglas, of Rosehaugh, Avoch, Ross-shire, Heifer, "Rosehaugh Clipper 5th" (36,350).
 3rd No. 59 McLaren, A., Milrig, Kirkliston, Heifer, "Gateside Wimple" (33,721).
 4th No. 60 Moubray, John J., of Naemoor, Rumbling Bridge, Heifer, "Naemoor Maud 5th" (40,315).
 V No. 54 Crawford and Balcarres, The Earl of, K.T., Balcarres, Colinsburgh, Fife, Heifer, "Balcarres Gretta" (35,092).
 H No. 58 Graham, A. G. Maxtone, Redgorton, Perth, Heifer, "Redgorton Butterfly 2nd" (36,850).
 C No. 57 Graham, A. G. Maxtone, Redgorton, Perth, Heifer, "Dorothy 16th" (36,844).

CLASS 8. HEIFER, born on or after 1st December, 1922, and not later than 31st March, 1923.—Premiums, £10, £5, £3, and £2.

- 1st No. 65 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Saltoun Golden Drop 4th" (36,332).
 2nd No. 69 Gardiner, James, Dargill, Crieff, "Dargill Vinolia 3rd."
 3rd No. 73 Scott, Joseph G., Congalton, Drem, "Congalton Augusta 9th."
 4th No. 72 Moray, The Earl of, Doune Lodge, Doune, "Doune Clipper 11th."
 V No. 75 Wilson, Peter, Lawhill, Auchterarder, "Balthayock Augusta 33rd" (37,687).

- H No. 63 Butters, James, Masterton, Dunfermline, "Masterton Luxury."
 C No. 64 Dron, W. A. Crieffvechter, Crieff, "Cherry Blossom 2nd" (35,658).
 C No. 66 Fletcher, Captain A. M. Talbot, of Saltoun, Saltoun Hall, Pencaitland, East Lothian, "Saltoun Bellona."

CLASS 9. HEIFER, born on or after 1st April, 1923.—Premiums, £10, £5, £3, and £2, given by Scottish Central Shorthorn Breeders' Association.

- 1st No. 78 Finlayson, William, Throsk, Stirling, "Throsk Princess Broadhocks 16th."
 2nd No. 86 Kirk, Thomas, of Abbey Mains, Haddington, "Claret Gipsy."
 3rd No. 85 Hill, Robert Wylie, of Balthayock, Perth, "Balthayock Augusta 34th."
 4th No. 89 M'Laren, A., Milrig, Kirkliston, "Fairy Fern."
 V No. 93 Scott, Joseph G., Congalton, Drem, "Congalton Crocus 2nd."
 H No. 91 Moubray, John J., of Naemoor, Rumbling Bridge, "Naemoor Jealousy 11th."
 C No. 90 Moray, The Earl of, Doune Lodge, Doune, "Doune Clipper 12th."
 C No. 92 Moubray, John J., of Naemoor, Rumbling Bridge, "Naemoor Lavender 4th."

DAIRY SHORTHORN.

PRESIDENT'S CHAMPION MEDAL for best Dairy Shorthorn.

Insufficient Entries.

CLASS 10. DAIRY SHORTHORN COW, in Milk, born in or before 1920, eligible for, and entered in Coates's Herd-Book, or pedigree sent for such entry previous to the Show.—Premiums, £10, £5, £3, and £2; First Prize given by the Shorthorn Society.

Insufficient Entries.

Silver Medal to the Breeder of the winner of the First Prize—given by the Shorthorn Society.

Insufficient Entries.

CLASS 11. DAIRY SHORTHORN COW (or HEIFER), in Milk, born in or after 1921, eligible for, and entered in Coates's Herd-Book, or pedigree sent for such entry previous to the Show.—Premiums, £10, £5, £3, and £2; First Prize given by the Shorthorn Society.

Insufficient Entries.

Silver Medal to the Breeder of the winner of the First Prize—given by the Shorthorn Society.

Insufficient Entries.

CLASS 12. DAIRY SHORTHORN BULL, born in 1923, entered or pedigree accepted for entry in Coates's Herd-Book. No Bull is eligible to compete unless registered or accepted for registration in the Year-Book of the Dairy Shorthorn Association.—Premiums, £10, £5, £3, and £2; First and Second Prizes given by Dairy Shorthorn Association.

Insufficient Entries.

ABERDEEN-ANGUS.

PRESIDENT'S CHAMPION MEDAL for best Aberdeen-Angus Animal.

No. 133 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire, "Evelusive of Ballindalloch" (67,167).

Reserve—No. 98 Findlay, Sir John R., K.B.E., of Aberlour, Aberlour House, Aberlour, "Boxer of Ballindalloch" (47,409).

Ballindalloch Challenge Cup, value £50, for the best Bull of any age in Classes 13, 14, and 15, given by the late Sir George Macpherson Grant, Bart.

No. 98 Findlay, Sir John R., K.B.E., of Aberlour, Aberlour House, Aberlour, "Boxer of Ballindalloch" (47,409).

Breeder of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.

No. 98 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire.

Breeder of best Bull of any age in Classes 13, 14, and 15—The Silver Medal.

No. 98 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire.

Champion Gold Medal for best animal in the Breeding Classes, Breeding Animals shown as "Extra Stock" being eligible to compete—given by the Aberdeen-Angus Cattle Society.

No. 133 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire, "Evelusive of Ballindalloch" (67,167).

CLASS 13. BULL, born before 1st December, 1921.—

Premiums, £15, £10, £5, and £3.

1st No. 98 Findlay, Sir John R., K.B.E., of Aberlour, Aberlour House, Aberlour, "Boxer of Ballindalloch" (47,409).

2nd No. 99 Howison, A. W., Lochbank, Blairgowrie, "Romping Rover" (51,508).

3rd No. 100 Marshall & Mitchell, Bleaton, Blairgowrie, "Esthon of Bleaton" (50,395).

4th No. 97 Duff, Lieut.-Colonel Garden B., D.S.O., Hatton Castle, Turriff, "Gaffer Stemedé" (48,266).

V No. 96 Arnot, D. R., Mains of Edzell, Edzell, "Black Boy of Curragh" (42,880).

CLASS 14. BULL, born on or after 1st December, 1921.—

Premiums, £15, £10, £5, and £3.

1st No. 107 Russell, G. H., The Burn, Edzell, "Everil of Ballindalloch" (52,678).

2nd No. 105 Petrie, John M'G., Asleid, New Deer, Aberdeen, "Evolvan of Ballindalloch" (52,699).

3rd No. 104 Howison, A. W., Lochbank, Blairgowrie, "Peribos" (53,320).

4th No. 111 Whyte, James, Hayston, Glamis, "Eclipse of Millford" (52,263).

V No. 108 Scott, William, Aldbar Home Farm, Brechin, "Envious Laddie" (52,462).

H No. 110 Whyte, Archibald, Spott, Kirriemuir, "Prince Fraser" (53,470).

CLASS 15. BULL, born on or after 1st December, 1922.—

Premiums, £12, £8, £4, and £2.

1st No. 126 Petrie, John M'G., Asleid, New Deer, Aberdeen, "Bolsor" (54,104).

2nd No. 128 Robertson, Peter D., Castlecraig, Nigg, Ross-shire, "Jupiter of Castlecraig" (55,160).

- 3rd No. 117 Duff, Lieut.-Colonel Garden B., D.S.O., Hatton Castle, Turriff, "Director of Hatton" (54,316).
 4th No. 130 Whyte, Alexander, East Denoon, Glamis, "Denoon Burgess 2nd" (54,294).
 V No. 129 Strathmore, The Earl of, G.C.V.O., Glamis Castle, Glamis, "Prince Correa" (55,618).
 H No. 112 Allan, John M., Easter Duthil, Carr Bridge, Strathspey, "Black Ben of Duthil" (54,009).
 C No 116 Cochran, Charles A., Parkhead, Alyth, Perthshire, "Ensign of Lochbank" (54,558).

Ballindalloch Challenge Cup, value £50, for the best Cow of any age in Classes 16 and 17 given by the late Sir John Macpherson Grant, Bart.

- No. 133 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire, "Evelusive of Ballindalloch" (67,167).

Breeder of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.

- No. 133 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire.

CLASS 16. COW, in Milk, born before 1st December, 1920.—
 Premiums, £12, £8, £4, and £2.

- 1st No. 133 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire, "Evelusive of Ballindalloch" (67,167).
 2nd No. 138 Reid, Andrew Thomson, of Auchterarder House, Auchterarder, "Proud Genesta" (63,263).
 3rd No. 142 Wilson, Walter, Inchgower, Buckie, "Beaver Maid" (68,529).
 4th No. 134 Macbeth, W. Gilchrist, of Dunira, Comrie, "Eva 6th of Ballindalloch" (64,737).
 V No. 135 Marshall & Mitchell, Bleaton, Blairgowrie, "Ellen of Damside" (66,287).
 H No. 136 Marshall & Mitchell, Bleaton, Blairgowrie, "Beloved Maid of Bleaton" (67,727).
 C No. 140 Whyte, Alexander, East Denoon, Glamis, "Jip of Denoon" (66,052).

EXTRA STOCK.

The following was awarded the Silver Medal :—

- No. 143 Macbeth, W. Gilchrist, of Dunira, Comrie, "Buxom Maid of Connage" (65,203).

CLASS 17. COW, in Milk, born on or after 1st December, 1920.
 Premiums, £12, £8, £4, and £2.

- 1st No. 149 Shiach, Gordon R., of Rosebrae, Elgin, "Evergreen of Rosebrae" (70,532).
 2nd No. 147 Macbeth, W. Gilchrist, of Dunira, Comrie, "Kobe" (69,602).
 3rd No. 151 Wilson, Walter, Inchgower, Buckie, "Eyrngo" (70,880).
 4th No. 148 Scott, William, Aldbar Home Farm, Brechin, "Blackbird of Whiteside 8th" (69,496).
 V No. 145 Duncan, John Bryce, Newlands, Dumfries, "Pearl of Newlands" (69,287).

CLASS 18. COW or HEIFER, born on or after 1st December, 1921.—
 Premiums, £10, £5, £3, and £2.

- 1st No. 157 Kerr, J. E., of Harviestoun, Dollar, Heifer, "Jeka Erica" (72,127).
 2nd No. 158 Kerr, J. E., of Harviestoun, Dollar, Heifer, "Jessamine Erica" (72,129).
 3rd No. 162 Stewart, Sir R. K., K.B.E., of Murdostoun, Newmains, Heifer, "Black Bunt of Tullochgribban" (72,721).

- 4th No. 161 Petrie, John M'G., Asleid, New Deer, Aberdeen. Heifer, "Evaboxa" (72,547).
 V No. 163 Wilson, Walter, Inchgower, Buckie, Heifer, "Elemi 3rd" (73,237).
 H No. 155 Findlay, Sir John R., K.B.E., of Aberlour, Aberlour House, Aberlour, Heifer, "Gentian 3rd of Aberlour" (71,638).

CLASS 19. HEIFER, born on or after 1st December, 1922, and before 1st March, 1923.—Premiums, £10, £5, £3, and £2.

- 1st No. 166 Cumming, J. F., Kinnermony Farm, Aberlour, "Maid of Bummers 2nd" (73,340).
 2nd No. 172 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire, "Evexina of Ballindalloch" (74,159).
 3rd No. 178 Kerr, J. E., of Harviestoun, Dollar, "Jeana Erica" (74,423).
 4th No. 171 Grant, Sir George Macpherson, Bart., The Castle, Ballindalloch, Banffshire, "Evelutia of Ballindalloch" (74,155).
 V No. 192 Whyte, Archibald, Spott, Kirriemuir, "Village Patricia" (75,488).
 H No. 176 Howison, A. W., Lochbank, Blairgowrie, "Jilt 2nd of Lochbank" (74,329).
 C No. 191 Whyte, Archibald, Spott, Kirriemuir, "Pinky's Witch" (75,482).
 C No. 183 Murray, Thomas, Laigh Grange, Maybole, "Bonnie Bouquet 21st" (75,209).

CLASS 20. HEIFER, born on or after 1st March, 1923.—Premiums, £10, £8, £4, and £2.

- 1st No. 194 Chapman, Archibald, Slackadale, Turriff, "Blushing Maid of Bridgend" (73,443).
 2nd No. 197 Reid, Andrew Thomson, of Auchterarder House, Auchterarder, "Erica of Auchterarder" (74,342).
 3rd No. 199 Whyte, Archibald, Spott, Kirriemuir, "Village Emily" (75,486).
 4th No. 193 Allan, John M., Easter Duthil, Carr Bridge, Strathspey, "Erica E 4th of Duthil" (73,346).
 V No. 196 Kerr, J. E., of Harviestoun, Dollar, "Julia Erica" (74,424).

GALLOWAY.

PRESIDENT'S CHAMPION MEDAL for best Galloway.

- No. 214 Graham, Robert, Chapel of Logan, Half Morton, Canonbie, "Logan Lady 5th" (26,463).
 Reserve—No. 203 Little, D. & J., Whitehill, Corrie, Lockerbie, "Punch of Dalwyne" (13,727).

Dr. Gillespie Memorial Challenge Trophy, value £50, for best Galloway Animal registered in the *Galloway Herd-Book*, entered in any of the *Breeding Classes*, *Breeding Animals* shown as "Extra Stock" being eligible to compete—given by the Galloway Cattle Society of Great Britain and Ireland.

- No. 214 Graham, Robert, Chapel of Logan, Half Morton, Canonbie, "Logan Lady 5th" (26,463).

Breeder of best Bull of any age in Classes 21, 22, and 23—The Silver Medal.
 No. 203 Blackley, John, Marchhill, Dumfries.

CLASS 21. BULL, born before 1st December, 1921.—Premiums, £15, £10, £5, and £3.

- 1st No. 203 Little, D. & J., Whitehill, Corrie, Lockerbie, "Punch of Dalwyne" (13,727).
 2nd No. 200 Buchanan-Jardine, Sir R. W., Bart., of Castle Milk, Lockerbie, "Challenger of Castle Milk" (14,499).

- 3rd No. 201 Drynan, John, Knockiebay, New Luce, "Quintin of Waterside" (14,005).
 4th No. 202 Graham, Robert, Auchengassel, Twynholm, "Contender 4th of Stepford" (14,870).

CLASS 22. BULL, born on or after 1st December, 1921.—

Premiums, £15, £10, £5, and £3.

- 1st No. 205 Wilson, James, & Son, Tundergarth Mains, Lockerbie, "Mormon's Heir" (15,033).
 2nd No. 204 Paterson, Robert Jardine, Balgray Home Farm, Lockerbie, "Kennedy of Corriehalls" (15,112).

CLASS 23. BULL, born on or after 1st December, 1922.—

Premiums, £12, £8, £4, and £2.

- 1st No. 209 Graham, Robert, Auchengassel, Twynholm, "Mark Dandy Boy" (74D).
 2nd No. 207 Buchanan-Jardine, Sir R. W., Bart., of Castle Milk, Lockerbie, "Barmark Merlin" (15,284).
 3rd No. 210 Scott, John, Drumhumphry, Dalbeattie, "Drumhumphry St Louis" (15,437).
 4th No. 208 Donaldson, William Betts, Auchineden, Blanefield, Stirlingshire, "Hercules of Auchineden" (15,285).

CLASS 24. COW, any age, in Milk.—

Premiums, £12, £8, £4, and £2.

- 1st No. 214 Graham, Robert, Chapel of Logan, Half Morton, Canonbie, "Logan Lady 5th" (26,463).
 2nd No. 212 Graham, Robert, Auchengassel, Twynholm, "Sally 4th of Auchengassel" (26,993).
 3rd No. 213 Graham, Robert, Chapel of Logan, Half Morton, Canonbie, "Governess of Logan" (24,031).
 4th No. 211 Buchanan-Jardine, Sir R. W., Bart., of Castle Milk, Lockerbie, "Coronis III. of Castle Milk" (27,023).
 V No. 216 Wilson, James, & Son, Tundergarth Mains, Lockerbie, "Lady Alice of Tundergarth Mains" (26,763).
 H No. 215 Scott, John, Drumhumphry, Dalbeattie, "Drumhumphry Cowslip 32nd" (28,275).

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 217 Scott, John, Drumhumphry, Dalbeattie, "Drumhumphry Ruby Princess" (27,187).

CLASS 25. COW or HEIFER, born on or after 1st December, 1921.—

Premiums, £10, £5, £3, and £2.

- 1st No. 222 Donaldson, William Betts, Auchineden, Blanefield, Stirlingshire, Heifer, "Princess of Auchineden" (28,479).
 2nd No. 227 Little, D. & J., Whitehill, Corrie, Lockerbie, Heifer, "Lady Nan of Corriehalls" (28,656).
 3rd No. 224 Graham, Robert, Auchengassel, Twynholm, Heifer, "Lady Lina 2nd" (28,549).
 4th No. 229 Paterson, Robert Jardine, Balgray Home Farm, Lockerbie, Heifer, "Joan 6th of Scroggiehall" (28,801).
 V No. 225 Graham, Robert, Chapel of Logan, Half Morton, Canonbie, Heifer, "Gratitude 8th of Logan" (28,557).
 H No. 218 Buchanan-Jardine, Sir R. W., Bart., of Castle Milk, Lockerbie, Heifer, "Triumph of Westwater" (28,487).

- C No. 226 Graham, Robert, Chapel of Logan, Half Morton, Canonbie, Heifer,
"Logan Lady 11th" (23,559).
C No. 228 Paterson, Robert Jardine, Balgray Home Farm, Lockerbie, Heifer,
"Tarbreoch Doris 20th" (23,454).

CLASS 26. HEIFER, born on or after 1st December, 1922.—
Premiums £10, £5, £3, and £2.

- 1st No. 233 Donaldson, William Betts, Auchineden, Blanefield, Stirlingshire,
"Clare of Auchineden" (29,019).
2nd No. 236 Little, D. & J., Whitehill, Corrie, Lockerbie, "Lady Alice 3rd"
(29,170).
3rd No. 234 Donaldson, William Betts, Auchineden, Blanefield, Stirlingshire,
"Favourite of Auchineden" (29,020).
4th No. 231 Buchanan-Jardine, Sir R. W., Bart., of Castle Milk, Lockerbie,
"Fashion II. of Castle Milk" (29,145).
V No. 239 Scott, John, Drumhumphry, Dalbeattie, "Drumhumphry Ruby
Princess 2nd" (29,352).
H No. 235 Graham, Robert, Chapel of Logan, Half Morton, Canonbie,
"Gratitude 9th" (29,087).
C No. 232 Donaldson, William Betts, Auchineden, Blanefield, Stirlingshire,
"Olivia of Auchineden" (29,015).

HIGHLAND.

PRESIDENT'S CHAMPION MEDAL for best Highland Animal.

- No. 245 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, "Iarla Buidhe
of Atholl."
Reserve—No. 268 Southesk, The Earl of, Kinnaird Castle, Brechin, Heifer,
"Princess Maura VIII."

Perpetual Victory Challenge Cup, approximate value 50 Guineas, *for the best
animal in the Male Classes, "Extra Stock" being eligible to compete—
given by the Highland Cattle Society of Scotland.*

- No. 245 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, "Iarla Buidhe
of Atholl."

Breeder of best Bull of any age in Classes 27, 28, and 29—The Silver Medal.

- No. 245 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl.

CLASS 27. BULL, born before 1922.—
Premiums, £15, £10, £5, and £3.

- 1st No. 242 Invernairn, Lord, of Strathnairn, Flichity Mains, Inverness,
"Bathar Taghte."
2nd No. 244 Southesk, The Earl of, Kinnaird Castle, Brechin, "Glen Mark."

CLASS 28. BULL, born in 1922.—
Premiums £15, £10, £5, and £3.

- 1st No. 245 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, "Iarla
Buidhe of Atholl."
2nd No. 249 Southesk, The Earl of, Kinnaird Castle, Brechin, "Carrington IV."
3rd No. 247 M'Intyre, Peter, Tighnablaire, Comrie, "Gille Ruadh II. of Kil-
chamaig."

CLASS 29. BULL, born in 1923.—
Premiums, £12, £8, £4, and £2.

- 1st No. 250 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, "Osanaich
of Atholl."
2nd No. 253 Southesk, The Earl of, Kinnaird Castle, Brechin, "Glenisla."

Perpetual Victory Challenge Cup, approximate value 35 Guineas, *for the best animal in the Female Classes, "Extra Stock" being eligible to compete—given by the Highland Cattle Society of Scotland.*

No. 268 Southesk, The Earl of, Kinnaird Castle, Brechin, Heifer, "Princess Maura VIII."

CLASS 30. COW, of any age, in Milk.—

Premiums, £12, £8, £4, and £2.

- 1st No. 258 Maitland, Brig-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Almira II. of Errol."
 2nd No. 261 Southesk, The Earl of, Kinnaird Castle, Brechin, "Corrina IV." (9401).
 3rd No. 259 Maitland, Brig-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Fuinary Queen of Errol."
 4th No. 260 Maitland, Brig-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Shuna of Errol."

CLASS 31. COW or HEIFER, born in 1921.—

Premiums, £10, £5, £3, and £2.

- 1st No. 268 Southesk, The Earl of, Kinnaird Castle, Brechin, Heifer, "Princess Maura VIII."
 2nd No. 267 Maitland, Brig-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, Heifer, "Fuinary Queen II. of Errol."
 3rd No. 262 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, Heifer, "Bean Bhan X. of Atholl."
 4th No. 263 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, Heifer, "Bheadarach VI. of Atholl."
 V No. 269 Southesk, The Earl of, Kinnaird Castle, Brechin, Heifer, "Princess Maura VII."

CLASS 32. HEIFER, born in 1922.—

Premiums, £10, £5, £3, and £2.

- 1st No. 275 Maitland, Brig-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol, "Fuinary Princess of Errol."
 2nd No. 276 Southesk, The Earl of, Kinnaird Castle, Brechin, "Princess Maura IX."
 3rd No. 277 Southesk, The Earl of, Kinnaird Castle, Brechin, "Sidonia VI."
 4th No. 271 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, "Bean Bhan XII. of Atholl."
 V No. 270 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, "Bean Bhan XI. of Atholl."

AYRSHIRE.

CONDITIONS.

1. To be eligible for competition in the Ayrshire Classes cows must have an authenticated milk yield, and younger females and bulls an authenticated milking pedigree, of a definite minimum amount.

2. The minimum amount referred to shall be as follows, calculated on the basis of a period between calvings of 52 weeks, and 3.8 per cent. of butter-fat:—

- (a) Cows which have completed two or more lactations—700 gallons.
- (b) Cows which have completed only one lactation—600 gallons.
- (c) Younger females and bulls—an authenticated milking pedigree for dam and dam of sire on a similar basis.

3. In the case of cows with two or more lactations the record lodged may be that for any year the Exhibitor may select.

PRESIDENT'S CHAMPION MEDAL for best Ayrshire.

No. 313. Howie, Jas., Hillhouse, Kilmarnock, "Hobsland Duplicate" (22,581)
Reserve—No. 285 Ferguson, William L., Catlinns, Lockerbie, "Edingham
Belinda" (54,337).

Cowhill Champion Cup, approximate value £30, for best animal of the Ayrshire breed, entered with a number in the Herd-Book. Presented by Major Henry Keswick, Cowhill Tower, Dumfries, to Ayrshire Cattle Herd-Book Society to be competed for annually at the Shows of the Highland and Agricultural Society of Scotland.

No. 313. Howie, Jas., Hillhouse, Kilmarnock, "Hobsland Duplicate" (22,581).

Special Prize of £10 for the best Female Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book not later than 1st June, 1924—given by the Ayrshire Cattle Herd-Book Society.

No. 285 Ferguson, William L., Catlinns, Lockerbie, "Edingham Belinda" (54,337).

CLASS 33. COW in Milk, born before 1921.—

Premiums, £12, £8, and £4.

- 1st No. 278 Clark, John, Dunrod Farm, Inverkip, "Dunrod Zena 3rd" (75,981).
2nd No. 281 Seton, James, Shewalton Mains, Irvine, "Shewalton Mains Katie" (58,367).

CLASS 34. COW in Milk, born on or after 1st January, 1921.—

Premiums, £10, £7, and £3.

- 1st No. 283 Stewart, Sir Hugh Shaw, Bart., C.B., Ardgowan, Inverkip, "Ardgowan Noble Lady" (84,231).

CLASS 35. COW, of any age, in Calf, and due to calve before 1st December of the year of the Show.—Premiums, £10, £7, and £3.

- 1st No. 285 Ferguson, William L., Catlinns, Lockerbie, "Edingham Belinda" (54,337).
2nd No. 280 Osborne, Robert, Morton Mains, Thornhill, Dumfriesshire, "Morton Mains Daisy" (53,205).
3rd No. 284 Barr, Thomas, Hobsland, Monkton, "Hobsland Nancy 5th" (57,120).
V No. 288 Houldsworth, Lieut.-Colonel W. T. R., Threave, Kirkmichael, Ayrshire, "Netherhall Whitle" (77,400).
H No. 286 Ferguson, William L., Catlinns, Lockerbie, "Carlton Annie 16th" (60,124).

CLASS 36. HEIFER, born in or after 1921, in Calf, and due to calve before 1st December of the year of the Show.—Premiums, £10, £7, and £3.

- 1st No. 293 Howie, James, Hillhouse, Kilmarnock, "Howie's Starry Gem III." (83,640).
2nd No. 296 Wardrop, Patrick, Garlaff, Cumnock, "Garlaff Miss Elma" (84,719).
3rd No. 290 Cochrane, Alexander, Nether Craig, Kilmarnock, "Nether Craig Fiona" (84,656).
V No. 295 Stewart, Sir Hugh Shaw, Bart., C.B., Ardgowan, Inverkip, "Ardgowan Namza" (84,225).
H No. 294 Stewart, Sir Hugh Shaw, Bart., C.B., Ardgowan, Inverkip, "Ardgowan Noble Miss" (82,523).
O No. 292 Gilmour, Hugh, Windhill, Eaglesham, "Netherton Nerissa II." (85,905).

CLASS 37. HEIFER, born in 1922.—

Premiums, £10, £5, and £3.

- 1st No. 299 Gilmour, Hugh, Windhill, Eaglesham, "Netherton Naisie" (85,902).
 2nd No. 301 Osborne, Robert, Morton Mains, Thornhill, Dumfriesshire, "Morton Mains Mistletoe" (85,193).
 3rd No. 298 Cochrane, Alexander, Nether Craig, Kilmarnock, "Nether Craig Whirlwind Bride" (88,810).
 V No. 297 Airlie, The Earl of, Cortachy Castle, Kirriemuir, "Cortachy Buntie" (88,667).
 H No. 302 Stewart, Sir Hugh Shaw, Bart., C.B., Ardgowan, Inverkip, "Ardgowan Nobelia"

CLASS 38. HEIFER, born in 1923.—

Premiums, £8, £5, and £3.

- 1st No. 304 Buchanan, Andrew, Mid Grange, Dunlop "Hobsland Bet 18th" (88,566).
 2nd No. 303 Barr, Thomas, Hobsland, Monkton, Ayrshire, "Hobsland Jenny 18th" (88,571).
 3rd No. 307 Stewart, Sir Hugh Shaw, Bart., C.B., Ardgowan, Inverkip, "Ardgowan Mavourneen."

Special Prize of £10 for the best Male Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book not later than 1st June, 1924—given by the Ayrshire Cattle Herd Book Society.

- No. 313 Howie, Jas., Hillhouse, Kilmarnock, "Hobsland Duplicate" (22,581).

Breeder of best Bull of any age in Classes 39, 40, and 41—The Silver Medal.

- No. 313 Barr, Thomas, Hobsland, Monkton.

CLASS 39. BULL, born before 1922.—

Premiums, £12, £8, and £4.

- 1st No. 309 Fowler, Peter, Cowglen, Whifflet, Coatbridge, "Cowhillan Flashlight" (18,187).
 2nd No. 308 Ferguson, William L., Catlinns, Lockerbie, "Catlinns Dreadnought" (19,148).
 3rd No. 310 Houldsworth, Lieut.-Colonel W. T. R., Threave, Kirkmichael, Ayrshire, "Hobsland Lucky Lad" (21,134).
 V No. 311 Osborne, Robert, Morton Mains, Thornhill, Dumfriesshire, "Morton Mains Come Again" (20,089).

CLASS 40. BULL, born in 1922.—

Premiums, £10, £7, and £3.

- 1st No. 313 Howie, James, Hillhouse, Kilmarnock, "Hobsland Duplicate" (22,581).

CLASS 41. BULL, born in 1923.—

Premiums, £8, £5, and £3.

- 1st No. 315 Howie, James, Hillhouse, Kilmarnock, "Howie's Top-Gallant" (23,746).
 2nd No. 316 Wardrop, Patrick, Garlaiff, Cumnock, "Lessnessock Creamola" (23,944).
 3rd No. 314 Gilmour, Hugh, Windhill, Eaglesham, "Bargenoch Stand Aside" (23,810).

BRITISH FRIESIAN.

PRESIDENT'S CHAMPION MEDAL for best British Friesian Animal.

No. 339 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Lochlands Maris" (47,020).

Reserve—No. 347 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Thornhill Jessie" (66,814).

Champion Prize of £5, given by the British Friesian Cattle Society *for the best Male exhibited.*

No. 319 Sinclair, David, Loirston, Nigg, Aberdeen, "Loirston Albert" (17,795).

CLASS 42. BULL, born in or before 1921.—

Premiums, £10, £5, and £3.

1st No. 319 Sinclair, David, Loirston, Nigg, Aberdeen, "Loirston Albert" (17,795).

2nd No. 320 Spence, John, Cullaloe, Burntisland, "Sudbourne Bertus 4th" (15,419).

3rd No. 318 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Hatsumerschaap P.I." (13,719).

V No. 317 Jack, A., Brunstane Mills, Musselburgh, "Dunnald Knave" (13,831).

CLASS 43. BULL, born in 1922.—

Premiums, £10, £5, and £3.

1st No. 322 Francis, G. A., West Seaton, Arbroath, "Seaton Roland 7th" (21,391).

2nd No. 323 Mackie, Alexander H., Hatton, Kinnoull, Perth, "Findlay Buttermann" (19,989).

3rd No. 324 M'Lauchlan, William, Balnadrurn, Pitlochry, "Hedges Roland" (20,315).

V No. 321 Crichton, J. B., Luthrie Bank, Cupar-Fife, "Luthrie (Imported 1922) Kaapstad" (20,869).

CLASS 44. BULL, born in 1923.—

Premiums, £10, £5, and £3.

1st No. 330 Pathhead and Sinclairtown Reform Co-operative Society, Limited, 102 Commercial Street, Kirkcaldy, "Douneside Sir Simon."

2nd No. 329 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Hache Apollo P.I."

3rd No. 327 Christison, C. & W., Barglass, Kirkinner, Wigtownshire, "Denniston Bert Bravo."

V No. 331 Spence, Andrew, Commieston, Montrose, "Commieston Bromley Ceres P.I."

H No. 325 Adams, David, Auchencraig, Dumbarton, "Riccartsbarr Akkebot."

Champion Prize of £5, given by the British Friesian Cattle Society *for the best Female exhibited.*

No. 339 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Lochlands Maris" (47,020).

CLASS 45. COW in Milk, born in or before 1920.—

Premiums, £10, £5, and £3.

1st No. 336 Spence, Andrew, Commieston, Montrose, "Commieston Watch" (28,062).

- 2nd No. 332 Bute, The Marquis of, K.T., Mount Stuart, Rothesay, "Haydon Farewell of Holland P.I." (33,864).
 3rd No. 334 Francis, G. A., West Seaton, Arbroath, "Meadowend Emerald Again" (18,564).
 V No. 337 Spence, Andrew, Commieston, Montrose, "Commieston Wristlet 2nd" (44,136).
 H No. 333 Crichton, J. B., Luthrie Bank, Cupar-Fife, "Seaton Damsel" (35,904).

CLASS 46. COW in Calf, and not in Milk, born in or before 1920.—
 Premiums, £10, £5, and £3.

- 1st No. 339 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Lochlands Maris" (47,020).
 2nd No. 338 Bute, The Marquis of, K.T., Mount Stuart, Rothesay, "Bute Lady Mary" (37,646).
 3rd No. 341 Wilson, R. P., Langfaulds, Bearsden, "Dunninald Janna" (38,520).
 V No. 340 Spence, John, Cullaloe, Burntisland, "Cart Mabel" (37,726).

CLASS 47. COW or HEIFER in Milk, born in 1921 or 1922.—
 Premiums, £10, £5, and £3.

Not Forward.

CLASS 48. HEIFER in Calf, with her first calf to calve before 3 years old.—
 Premiums, £10, £5, and £3.

- 1st No. 347 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Thornhill Jessie" (66,814).
 2nd No. 348 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Bessie" (60,910).
 3rd No. 352 Spence, Andrew, Commieston, Montrose, "Commieston Affannie" (60,166).
 V No. 351 Sinclair, David, Loirston, Nigg, Aberdeen, "Loirston Janetta 2nd" (54,776).
 H No. 353 Spence, Andrew, Commieston, Montrose, "Commieston Awatching" (60,174).
 C No. 349 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Benbecula 2nd" (60,908).
 C No. 350 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Noreen" (60,924).

CLASS 49. HEIFER born before 1st July, 1923.—
 Premiums, £10, £5, and £3.

- 1st No. 361 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Ischia."
 2nd No. 365 Sinclair, William, Loirston, Nigg, Aberdeen, "Kirkhill Jeltje 4th."
 3rd No. 357 Macaulay, Andrew, Lathalmond Farm, Dunfermline, "Lathalmond Lady Peggy."
 V No. 355 Francis, G. A., West Seaton, Arbroath, "Seaton Lady Brand 5th"
 H No. 362 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Benbecula 3rd."
 C No. 363 MacRobert, Trustees of Sir Alasdair W., Bart., Douneside Home Farm, Tarland, "Douneside Minna."
 C No. 358 Mackie, Alexander H., Hatton, Kinnoull, Perth, "Bronville Betje."

CLASS 50. HEIFER, born on or after 1st July 1923.—
 Premiums, £10, £5, and £3.

- 1st No. 370 Russell, James P., South Bardowie, Milngavie, "Lochlands Pel Melsa."
 2nd No. 368 Mackie, Alexander H., Hatton, Kinnoull, Perth, "Bronville Plum."
 3rd No. 371 Storrar, Alexander, Wester Nether Urquhart, Gateside, Fife, "Stratheden Mina."

RED POLL.

PRESIDENT'S CHAMPION MEDAL for best Red Poll Animal.

No. 380 Ewing, Miss Crum, Strathleven, Dumbarton, "Ashmoor Million" (28,465).

Reserve—No. 383 Collins, Charles M., Rowardennan, Loch Lomond, "Kelvindale Mattock."

Kinmount Challenge Cup, value about £50, for the best Female Animal in the Red Poll Classes registered in the Red Poll Cattle Society's Herd-Book, "Extra Stock" being eligible to compete. This Cup was presented to the Society by Lieut.-Colonel Charles Brook of Kinmount, Annan.

No. 380 Ewing, Miss Crum, Strathleven, Dumbarton, "Ashmoor Million" (28,465).

CLASS 51. BULL, born in or before 1922.—

Premiums, £10, £5, and £3.

1st No. 372 Alexander, William, Banknock House, Banknock, "Sudbourne Cri-Mo" (12,170).

2nd No. 373 Collins, Charles M., Rowardennan, Loch Lomond, "Ashmoor Jester" (12,207).

CLASS 52. BULL, born in 1923.—

Premiums, £10, £5, and £3.

1st No. 375 Ewing, Miss Crum, Strathleven, Dumbarton, "Strathleven Achilles."

CLASS 53. COW in Milk, born before 1922.—

Premiums, £10, £5, and £3.

1st No. 380 Ewing, Miss Crum, Strathleven, Dumbarton, "Ashmoor Million" (28,465).

2nd No. 378 Alexander, William, Banknock House, Banknock, "Starling" (24,868).

CLASS 54. HEIFER, born in 1922.—

Premiums, £10, £5, and £3.

1st No. 382 Collins, Charles M., Rowardennan, Loch Lomond, "Ashmoor Mummer" (30,672).

2nd No. 381 Alexander, William, Banknock House, Banknock, "Banknock Chicago Molly" (30,711).

CLASS 55. HEIFER, born in 1923.—

Premiums, £10, £5, and £3.

1st No. 383 Collins, Charles M., Rowardennan, Loch Lomond, "Kelvindale Mattock."

BELTED GALLOWAY.

PRESIDENT'S CHAMPION MEDAL for best Belted Galloway Animal.

No. 380 Graham, Robert, Auchengassel, Twynholm, Cow, "Mark Polly" (219 B).

Reserve—No. 394 Graham, Robert, Auchengassel, Twynholm, "Mark Elsie 4th" (373 B).

Knockbrex Challenge Cup, value £50, for best Belted Galloway Animal, "Extra Stock" being eligible to compete. This Cup is offered by Mrs Brown of Knockbrex for the best Belted Galloway animal registered in the Dun and Belted Galloway Cattle Breeders' Association Herd-Book, entered in any of the breeding classes, at the Show or Shows at which it may be competed for.

No. 380 Graham, Robert, Auchengassel, Twynholm, Cow, "Mark Polly" (219 B).

CLASS 56. BULL, born before 1st December, 1922.—

Premiums, £8, £4 and £2.

- 1st No. 387 Graham, Robert, Auchengassel, Twynholm, "Mochrum Royal Guard" (128 B).

CLASS 57. BULL, born on or after 1st December, 1922.—

Premiums, £8, £4, and £2.

- 1st No. 388 Graham, Robert, Auchengassel, Twynholm, "Mark David" (117 B).

CLASS 58. COW or HEIFER, born before 1st December, 1921, in Milk or in Calf; if in Calf, to calve on or before 1st December of the year of the Show.—Premiums, £8, £4, and £2.

- 1st No. 390 Graham, Robert, Auchengassel, Twynholm, Cow, "Mark Polly" (219 B).

CLASS 59. HEIFER, born on or after 1st December, 1921.

Premiums, £8, £4, and £2.

- 1st No. 392 Graham, Robert, Auchengassel, Twynholm, "Mark Dora 2nd" (371 B).

CLASS 60. HEIFER, born on or after 1st December, 1922.

Premiums, £8, £4, and £2.

- 1st No. 394 Graham, Robert, Auchengassel, Twynholm, "Mark Elsie 4th" (373 B).

FAT CATTLE.

PRESIDENT'S CHAMPION MEDAL for best Fat Animal.

- No. 397 Reid, Andrew Thomson, of Auchterarder House, Auchterarder, "Black Blank of Auchterarder" (51,876).

Reserve—No. 406 Reid, William J., Fordhouse, Montrose, "Eveline 2nd of Milton" (75,027).

CLASS 61. OX, any pure Breed or Cross, born after 1st December, 1921.—

Premiums, £7 and £3.

- 1st No. 397 Reid, Andrew Thomson, Auchterarder House, Auchterarder, "Black Blank of Auchterarder" (51,876) (Aberdeen-Angus).
 2nd No. 398 Reid, William John, Fordhouse, Montrose, "Percy" (Aberdeen-Angus Bull—Cross Shorthorn Cow).
 C No. 396 Howison, A. W., Lochbank, Blairgowrie (Aberdeen-Angus Bull—Cross Cow).

CLASS 62. OX, any pure Breed or Cross, born after 1st December, 1922.—

Premiums, £7 and £3.

- 1st No. 399 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Jim" (Aberdeen-Angus Bull—Shorthorn Galloway Cow).

CLASS 63. HEIFER, any pure Breed or Cross, born after 1st December, 1921.—

Premiums, £7 and £3.

- 1st No. 402 Murray, Major the Hon. A. D., Pittfour Castle, Glencarse, "Squeak" (Shorthorn Bull—Cross Galloway Cow).

CLASS 64. HEIFER, any pure Breed or Cross, born after 1st December, 1922.—

Premiums, £7 and £3.

- 1st No. 408 Reid, William J., Fordhouse, Montrose, "Eveline 2nd of Milton" (75,027) (Aberdeen-Angus).
 2nd No. 405 Howison, A. W., Lochbank, Blairgowrie (Shorthorn Bull—Aberdeen-Angus Cow).

HORSES

FOR AGRICULTURAL PURPOSES.

DRAUGHT STALLIONS.

PRESIDENT'S CHAMPION MEDAL for best Clydesdale Stallion or Colt.

No. 454 Montgomery, Andrew M., of Nether Hall, Castle Douglas.

Reserve—No. 425 Park, Robert, Brunstane, Portobello, "Brunstane Again" (20,717).*Breeder of best Male Animal of any age in Classes 65, 66, 67, and 68—
The Silver Medal.*

No. 454 Sleigh, John P., of St John's Wells, Fyvie.

CLASS 65. STALLION, born before 1921.—
Premiums, £20, £15, £10, and £4.

- 1st No. 412 Montgomery, Andrew M., of Nether Hall, Castle Douglas, "Dunraven" (20,309).
 2nd No. 413 Sharp, T. Mercer, Bardrill, Blackford, Perthshire, "Dalhousie Prince" (20,729).
 3rd No. 411 Lumsden, Robert, Kippit, Dolphinton, "Hilton Autocrat" (19,751).
 4th No. 410 Kerr, R. & J., Abbey, Madderty, Crieff, "Dundurn Footprint" (20,308).
 V No. 407 Brown, Samuel, Culraven, Kirkcudbright, "Anack" (19,916).

CLASS 66. ENTIRE COLT, born in 1921.—
Premiums, £20, £15, £10, and £4.

- 1st No. 425 Park, Robert, Brunstane, Portobello, "Brunstane Again" (20,717).
 2nd No. 419 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie M'Quaid" (20,724).
 3rd No. 424 Murray, Douglas D., The Dene, Seaham Harbour, "Fyvie Discovery" (20,755).
 4th No. 426 Pollock, John, Byres Farm, Pollokshaws, "Flower of the Day" (20,914).
 V No. 418 Harper, Joseph, Rathillet, Cupar-Fife, "St Albion."
 II No. 415 Adams, David, Auchencraig, Dunbarton, "The Dunlop" (20,831).
 C No. 417 Gray, James, Birkenwood, Kippen Station, "Ditto" (20,734).
 C No. 421 Montgomery, Andrew M., of Nether Hall, Castle Douglas, "St Louis" (20,816).

CLASS 67. ENTIRE COLT, born in 1922.—
Premiums, £20, £15, £10, and £4.

- 1st No. 436 Montgomery, Andrew M., of Nether Hall, Castle Douglas, "Benefactor" (20,867).
 2nd No. 432 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Essential"
 3rd No. 431 Elliot, Charles S., Nisbet Hill, Duns, "Nisbet Platinum."
 4th No. 430 Clark, Allan, Woodbank, Windygates, Fife, "Woodbank Welcome" (21,007).
 V No. 433 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Lord Roberts" (20,895).
 II No. 428 Argo, George, Petty, Fyvie, "Petty Royal" (20,998).
 C No. 429 Clark, Alexander, Strathore, Thornton, "Pride of Strathore" (20,963).
 C No. 438 Montgomery, Andrew M., of Nether Hall, Castle Douglas, "Lethen Sensation" (20,936).

CLASS 68. ENTIRE COLT, born in 1923.

Premiums, £15, £10, £6, and £4.

- 1st No. 454 Montgomery, Andrew M., of Nether Hall, Castle Douglas.
 2nd No. 460 Smith, George T., Aitkenhead, Blairgowrie, "Radio."
 3rd No. 443 Clark, James, Netherlea, Cathcart, "Royal Enterprise."
 4th No. 440 Adams, David, Auchencraig, Dumbarton, "Footprint."
 V No. 449 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Exquisite."
 H No. 446 Dickie, James, Kelton House, Dumfries, "The Nyasa."
 C No. 459 Sharp, T. Mercer, Bardrill, Blackford, Perthshire, "Bonnie Bardrill."
 C No. 448 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Endeavour."
 C No. 456 Pollock, John, Byres Farm, Pollokshaws.
 C No. 450 Lamont, John, Ardyne, Toward, "Ardyne Excelsior."

DRAUGHT GELDINGS.

PRESIDENT'S CHAMPION MEDAL for best Draught Gelding.

No. 470 Sleigh, John P., of St John's Wells, Fyvie, "Harry."

Reserve—No. 479 Scottish Co-operative Wholesale Society, Limited, 95 Morrison Street, Glasgow, "Withheld."

CLASS 69. DRAUGHT GELDING, born before 1921.—

Premiums, £10, £5, and £3.

- 1st No. 470 Sleigh, John P., of St John's Wells, Fyvie, "Harry."
 2nd No. 469 Scottish Co-operative Wholesale Society, Limited, 95 Morrison Street, Glasgow, "Unity."
 3rd No. 465 Kyle, John W., Barskiven, Paisley, "Johnny."
 V No. 468 Scottish Co-operative Wholesale Society, Limited, 95 Morrison Street, Glasgow, "Sandy."
 H No. 466 Mather, William, Milne Graden, Coldstream, "Sergeant Murphy."
 C No. 472 Wilson, Robert, West Hurlet, Nitshill, "What's Wanted."

CLASS 70. DRAUGHT GELDING, born in 1921.—

Premiums, £6, £4, and £3.

- 1st No. 479 Scottish Co-operative Wholesale Society, Limited, 95 Morrison Street, Glasgow, "Withheld."
 2nd No. 473 Elliot, Charles S., Nisbet Hill, Duns, "Victor."
 3rd No. 483 Wilson, Robert, West Hurlet, Nitshill, "Topper."
 V No. 482 Sleigh, John P., of St John's Wells, Fyvie, "Jim."
 H No. 476 Miller, William S., Balmanno Castle, Bridge of Earn, "Farmer."
 C No. 480 Sharp, T. Mercer, Bardrill, Blackford, Perthshire, "Jim."

CLASS 71. DRAUGHT GELDING, born in 1922.—

Premiums, £6, £4, and £3.

- 1st No. 491 Wilson, Robert, West Hurlet, Nitshill, "Norman."
 2nd No. 490 Wilson, Robert, West Hurlet, Nitshill, "Eclipse."
 3rd No. 485 Clark, Alexander, Strathore, Thornton, "Welcome."
 V No. 484 Black, J. Belfrage, Tillywhaly, Milnathort, "Prince of Holton."
 H No. 488 Thomas, James, Bowhouse, Balbeggie, Perth, "Bowhouse Charlie."
 C No. 489 Thomson, Moffat S., of Lambden, Greenlaw, Berwickshire, "Big Ben."

DRAUGHT MARES AND FILLIES.

PRESIDENT'S CHAMPION MEDAL for best Clydesdale Mare or Filly.

No. 534 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Ella."

Reservé—No. 588 Reith, Miss E. M., Kennerty Farm, Peterculter, Aberdeenshire, "Irene."

Best Clydesdale Mare or Filly registered in the Clydesdale Stud-Book—Cawdor Challenge Cup, value 50 Guineas, given by the Clydesdale Horse Society.

No. 534 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Ella."

CLASS 72. MARE of any age, with Foal at foot.—

Premiums, £20, £12, £7, and £4.

- 1st No. 497 Gray, James, Birkenwood, Kippen Station, "Faith."
 2nd No. 494 Dickie, James, Kelton House, Dumfries, "Nyasa Queen" (53,496).
 3rd No. 495 Forteviot, Lord, Dupplin Castle, Perth, "Genista."
 4th No. 500 M'Connell, James, Boreland, Whauphill, "Emmeline" (52,565).
 V No. 493 Cumming, Dr John, The Elms, Beverley Road, Kingston-upon-Hull, "Kingston Perfect Lady."
 H No. 498 Kerr, J. F., of Harviestoun, Dollar, "Harviestoun Felicia."
 C No. 492 Argo, George, Petty, Fyvie, "Dunure Roseway." (53,302).

CLASS 73. YELD MARE, born before 1921.—

Premiums, £12, £9, £6, and £4.

- 1st No. 510 Mackay, Robert, Ballochmartin, Millport, "Cherry Blossom" (52,607).
 2nd No. 513 Reith, Miss E. M., Kennerty Farm, Peterculter, Aberdeen, "Dunure Destiny" (54,865).
 3rd No. 509 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Fairy."
 4th No. 508 Elliot, Charles S., Nisbet Hill, Duns, "Nisbet Harmony" (53,539).
 V No. 511 M'Nee, John, Afton House, Crieff, "Belle of Dundurn" (50,827).
 H No. 496 Gray, James, Birkenwood, Kippen Station, "Boquhan Elsie" (54,553).
 C No. 512 Park, Robert, Brunstane, Portobello, "Brunstane Fairy."

CLASS 74. YELD MARE or FILLY, born in 1921.—

Premiums, £12, £9, £6, and £4.

- 1st No. 517 Clark, Thomas, Pitlandie, Stanley, Perth, filly, "Margaret."
 2nd No. 521 Gray, James, Birkenwood, Kippen Station, filly, "Rue Mayflower."
 3rd No. 529 Reith, William & John, Kennerty, Peterculter, Aberdeenshire, filly, "Dunure Maybreeze."
 4th No. 528 Lumsden, Robert, Kippit, Dolphinton, filly, "Kippit Elma."
 V No. 519 Durno, James, Rothiebrisan, Fyvie, filly, "Princess Rhoda."
 H No. 522 Harper, Joseph, Rathillet, Cupar-Fife, filly, "St Martha."
 C No. 530 Russell, Andrew, Summerston, Maryhill, filly, "Jessie's Dream."

William Taylor Memorial Prize of £10 and Certificate to the Breeder of the best Clydesdale Filly entered in Classes 75 and 76—given by William Taylor Memorial Committee.

No. 534 Cairns, James, Abercrombie, St Monance.

CLASS 75. FILLY, born in 1922.—

Premiums, £12, £9, £6, and £4.

- 1st No. 534 Kilpatrick, James, Craigie Mains, Kilmarnock, "Craigie Ella."
 2nd No. 538 Sleigh, John P., of St John's Wells, Fyvie, "Wells Aileen."
 3rd No. 541 Walker, Robert, Langlands, Kilmaurs, "Langlands Blossome."
 4th No. 539 Stirling, Hugh B., Darlingsfield, Gordon, "Luxuriance."

- V No. 536 Reith, William & John, Kennerty Farm, Peterculter, Aberdeenshire, "Dunure Reel."
 H No. 532 Blair, David, Littleinch, Wormit, Fife, "Littleinch Norah."
 C No. 540 Tennent, R. B., Heavyside, Biggar, "Blackwood Sunset."

CLASS 76. FILLY, born in 1923.—

Premiums, £12, £9, £6, and £4.

- 1st No. 558 Reith, Miss E. M., Kennerty Farm, Peterculter, Aberdeenshire, "Irene."
 2nd No. 555 Murray, Douglas D., The Dene, Seaham Harbour, "Queen of them All."
 3rd No. 556 Paterson, Robert, Stamperland, Cathcart, "Queenie of Stamperland."
 4th No. 552 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Avena."
 V No. 548 Gardner, William, Gartentrach, Buchlyvie, "Vaxine."
 H No. 542 Armstrong, J. A., The Beeches, Tarraly, Carlisle, "Virol."
 C No. 554 M'Nee, John, Afton House, Crieff, "Beauty of Dundurn."

HUNTERS.

PRESIDENT'S CHAMPION MEDAL for best Hunter.

- No. 580 Allison, John M., Overton, Kirkliston, gelding "Haig,"
 Reserve—No. 566 Campbell, Miss, Garscube, Glasgow, filly, "Clipston Ladybird" (6087).

CLASS 77. HUNTER BROOD MARE, with Foal at foot.—

Premiums, £15, £7, and £3.

- 1st No. 564 Dalrymple, Miss Mary A., Elliston, St Boswells, "Promise" (2654).
 2nd No. 565 Nairn, Major R. Spencer, of Leslie House, Leslie, "Erin."
 3rd No. 563 Constable, Miss Marjorie, Soilzarie, Blairgowrie, "Mischief."

Best Hunter Filly, not exceeding three years old, registered with a number in the Hunter Stud-Book, or the entry tendered within a month of the award
 —Champion Gold Medal, given by the Hunters Improvement and National Light Horse Breeding Society.

- No. 566 Campbell, Miss, Garscube, Glasgow, "Clipston Ladybird" (6087).
 Reserve—No. 567 Cheape, Brig.-General, C.M.G., D.S.O., M.C., Wellfield, Gateside, Fife, "Salome."

CLASS 78. YELD MARE, FILLY, or GELDING, born in 1921—in hand.—

Premiums, £10, £5, and £3.

- 1st No. 566 Campbell, Miss, Garscube, Glasgow, filly, "Clipston Ladybird" (6087).
 2nd No. 567 Cheape, Brig.-General, C.M.G., D.S.O., M.C., Wellfield, Gateside, Fife, mare, "Salome."

CLASS 79. YELD MARE, FILLY, or GELDING, born in 1922—in hand.—

Premiums, £10, £5, and £3.

- 1st No. 568 Cheape, Brig.-General, C.M.G., D.S.O., M.C., Wellfield, Gateside, Fife, mare, "Sunflower."
 2nd No. 570 Robertson, Miss W. A., Stockbridge, Symington, Kilmarnock, filly, "Gay Morella."
 3rd No. 571 Thomson, Moffat S., of Lambden, Greenlaw, Berwickshire, filly, "Miss Murphy II." (6194).

CLASS 80. COLT, GELDING, or FILLY, born in 1923, the produce of thoroughbred Stallion or registered Hunter sire, out of Mare of any breed.—

Premiums, £10, £5, and £3.

- 1st No. 575 Thomson, Moffat S., of Lambden, Greenlaw, Berwickshire, gelding, "The Twin."
 2nd No. 573 Dalrymple, Miss Mary A., Elliston, St Boswells, colt, "Prince Charlie."
 3rd No. 572 Cheape, Brig.-General, C.M.G., D.S.O., M.C., Wellfield, Gateside, Fife, filly, "Grace Darling."
 V No. 574 Nairn, Major R. Spencer, of Leslie House, Leslie, gelding, "The Gowk."

CLASS 81. MARE or GELDING, born in or before 1920, to carry 13 stone and over—in saddle.—Premiums, £15, £10, and £5.

- 1st No. 576 Collins, Charles M., Barochan, Houston, gelding, "Gentleman."
 2nd No. 578 Macalister, J. W., Newstead, Crieff, Perthshire, gelding, "Red-skin."
 3rd No. 577 Duncan, John Bryce, Newlands, Dumfries, gelding, "The Jester."

CLASS 82. MARE or GELDING, born in or before 1920, to carry under 13 stone—in saddle.—Premiums, £15, £10, and £5.

- 1st No. 580 Allison, John M., Overton, Kirkliston, gelding, "Haig."
 2nd No. 582 Hutchison, Major R. G. O., Kinloch, Collessie, gelding, "Royalist."

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 583 Proctor, Capt. Alexander, The Haugh, Blairgowrie, colt, "Kitchener."

HACKNEYS.

(ALL SHOWN IN HAND.)

PRESIDENT'S CHAMPION MEDAL for best Hackney in Classes 83 to 85.

- No. 584 Shaw, Neil M., Commercial Hotel, Portpatrick, "Baron Shaw" (13,823).

CLASS 83. BROOD MARE, over 14 Hands, with Foal at foot, or to foal this season to a registered Sire. Registered in the Hackney Stud-Book.—Premiums, £10, £8, and £4.

(No Entry.)

CLASS 84. YELD MARE or FILLY, born in or after 1921. Registered in the Hackney Stud-Book.—Premiums, £8, £5, and £3.

(No Entry.)

CLASS 85. STALLION, born in or before 1921, over 14 Hands. Registered in the Hackney Stud-Book.—Premiums, £10, £8, and £4.

- 1st No. 584 Shaw, Neil M., Commercial Hotel, Portpatrick, "Baron Shaw" (13,823).

PONIES.

PRESIDENT'S CHAMPION MEDAL for best Pony.

- No. 585 Kerr, J. E., of Harviestoun, Dollar, "Sir Andra" (14,205).

Reserve—No. 588 Wardrop, James, 295 High Street, Kirkcaldy, mare, "Harviestoun Roma" (25,530).

CLASS 86. STALLION, 3 years old and upwards, 14 Hands and under—in hand.
Premiums, £5, £3, and £2.

1st No. 585 Kerr, J. E., of Harviestoun, Dollar, "Sir Andra" (14,205).

CLASS 87. YELD MARE, FILLY, or GELDING, 3 years old and upwards,
14 Hands and under—in saddle.—Premiums, £5, £3, and £2.

1st No. 588 Wardrop, James, 295 High Street, Kirkcaldy, mare, "Harviestoun Roma" (25,530).

HIGHLAND PONIES.

PRESIDENT'S CHAMPION MEDAL for best Highland Pony.

No. 589 Board of Agriculture for Scotland, Beechwood, Inverness, "Macpherson" (735).

Reserve—No. 611 Mackenzie, W. Dalziel, of Farr, House of Farr, Inverness, "Banchor Bhuidhe of Farr" (1191).

Special Prize of £10 for the best Highland Stallion, Mare, Colt, or Filly, entered or accepted for entry in the Highland Section of the National Pony Stud-Book, "Extra Stock" being eligible to compete. Competition strictly confined to animals passed sound and free from hereditary disease—given by the National Pony Society.

No. 589 Board of Agriculture for Scotland, Beechwood, Inverness, "Macpherson" (735).

CLASS 88. STALLION, born before 1922, not exceeding 14.2 Hands.—
Premiums, £8, £4, and £2.

1st No. 589 Board of Agriculture for Scotland, Beechwood, Inverness, "Macpherson" (735).

2nd No. 591 Robson, John, Jun., Lynegar, Watten, Caithness, "Thor II." (1054).

3rd No. 590 Board of Agriculture for Scotland, Beechwood, Inverness, "Faillie Rover" (1142).

EXTRA STOCK.

The following was awarded the Silver Medal:—

No. 592 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Glen Bernsdale" (891).

CLASS 89. MARE, born before 1922, not exceeding 14.2 Hands, Yeld or with Foal at foot.—Premiums, £8, £4, and £2.

1st No. 593 Atholl, The Duke of, K.T., Blair Castle, Blair Atholl, "Lady Jean II." (3071).

2nd No. 608 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Ribhinn Oig" (4689).

3rd No. 606 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Isa Ormiston" (4041).

V No. 597 Cameron, A., & Sons, Westside Farm, Brechin, "Highland Mary."

H No. 601 Nasmyth, Norman J., of Glenfarg House, Abernethy, "Sheila of Coulshill" (3463).

C No. 604 Wooley, Thomas, Commercial Hotel, Bonarbridge, Sutherland, "Betty."

CLASS 90. ENTIRE COLT, born on or after 1st January, 1922.

Premiums, £8, £4, and £2.

1st No. 611 Mackenzie, W. Dalziel, of Farr, House of Farr, Inverness, "Banchor Bhuidhe of Farr" (1191).

- 2nd No. 610 Board of Agriculture for Scotland, Beechwood, Inverness, "Faillie Marquis."
 3rd No. 609 Board of Agriculture for Scotland, Beechwood, Inverness, "Faillie Duke."
 H No. 612 Perrins, Dyson, D.C.L., of Ardross, Ardross Castle, Alness, "Tulloch Laddie."

CLASS 91. FILLY, born on or after 1st January, 1922.—

Premiums, £8, £4, and £2.

- 1st No. 615 Atholl, The Duke of, K.T., Blair Castle, Blair-Atholl, "Lady May."

WESTERN ISLAND PONIES.

PRESIDENT'S CHAMPION MEDAL for best Western Island Pony.

- No. 620 Cairns, James N., Ardlarach House, Isle of Luing, Argyllshire, "Noss Lassie" (4776).
Reserve—No. 616 Bowie, Allan J., Thrushcraig, Paisley, "Lord of the Isles"

Special Prize of £10 for the best Western Island Stallion, Mare, Colt, or Filly, entered, or accepted for entry, in the Highland Section of the National Pony Stud-Book, "Extra Stock" being eligible to compete. Competition is strictly confined to animals passed sound and free from hereditary disease—given by the Highland Pony Society.

- No. 620 Cairns, James N., Ardlarach House, Isle of Luing, Argyllshire, "Noss Lassie" (4776).

CLASS 92. STALLION, born before 1922, not exceeding 14 Hands.—

Premiums, £8, £4, and £2.

- 1st No. 616 Bowie, Allan J., Thrushcraig, Paisley, "Lord of the Isles" (999).
 2nd No. 617 Cairns, James N., Ardlarach House, Isle of Luing, Argyllshire, "Dougald of Luing."
 3rd No. 619 Ross, Charles D. M., Ibert, Crieff, "Beachdair" (1132).

CLASS 93. MARE, born before 1922, not exceeding 14 Hands, Yeld or with Foal at foot.—Premiums, £8, £4, and £2.

- 1st No. 620 Cairns, James N., Ardlarach House, Isle of Luing, Argyllshire, "Noss Lassie" (4776).
 2nd No. 623 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Maisie of Kinmonth" (4495).
 3rd No. 626 Maxwell, Miss Anne Stirling, Pollok House, Pollokshaws, "Corrour Spean" (4392).
 V No. 622 Fletcher, James Douglas, of Rosehaugh, Avoch, Ross-shire, "Ara of Rosehaugh."
 H No. 621 Fletcher, James Douglas, of Rosehaugh, Avoch, Ross-shire, "Flora of Rosehaugh."

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 629 Wright, J. Moncrieff, of Kinmonth, Bridge of Earn, "Isle of Arran Bonnie Jean" (4408).

CLASS 94. ENTIRE COLT, born on or after 1st January, 1922.—

Premiums, £8, £4, and £2.

- 1st No. 631 Maxwell, Miss Anne Stirling, Pollok House, Pollokshaws, "Corrour Ghulbinn" (1109).
 2nd No. 630 Mackenzie, J. H. Munro, of Calgary, Isle of Mull, "Pirate" (1204).

CLASS 95. FILLY, born on or after 1st January, 1922.—

Premiums, £8, £4, and £2.

- 1st No. 632 Ross, Charles D. M., Ibert, Crieff, "Glengyle II." (4781).

SHETLAND PONIES.

(ALL SHOWN IN HAND.)

PRESIDENT'S CHAMPION MEDAL for best Shetland Pony.

No. 633 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "Dibblitz of Penniwells."
Reserve—No. 662 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "May Queen
 of Penniwells" (3348).

Renfrewshire Perpetual Gold Challenge Cup, value £250, *for best Shetland Pony, "Extra Stock" being eligible to compete.* This Cup, along with an endowment of £500, was provided from money collected in Renfrewshire by the late Provost Muir MacKean of Paisley, and is in commemoration of the Society's first Show in the county of Renfrew in 1913.

No. 633 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "Dibblitz of Penniwells."
Reserve—No. 662 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "May Queen
 of Penniwells" (3348).

Silver Cup for best Shetland Pony of either sex and any age, drawn from ordinary Classes—and shown in saddle—given by Mr R. W. R. Mackenzie of Earlsall.

No. 634 Mackenzie, R. W. R., of Earlsall, Leuchars, "Bandrol" (635).

Best group of Shetland Ponies, consisting of one male and two females, of any age, entered in Classes 96, 97, 98, 99, and 100.—Premium, £10—given by "Five Lovers of the Breed," per Mr W. Mungall of Transy.

Nos. 633, 648, and 677 Duffus, Mrs Etta, Penniwells, Elstree, Herts.

Silver Medal for the best Shetland Pony of the sex opposite to that of the winner of the President's Medal, entered or eligible for entry in the Shetland Pony Stud-Book—given by the Shetland Pony Stud-Book Society.

No. 662 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "May Queen of Penniwells" (3348).

CLASS 96. STALLION, not exceeding 10½ Hands, born before 1921.—
 Premiums, £8, £5, £3, and £2.

- 1st No. 633 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "Dibblitz of Penniwells."
 2nd No. 634 Mackenzie, R. W. R., of Earlsall, Leuchars, "Bandrol" (635).
 3rd No. 640 Robertson, Mrs G., Sandhills, Monkton, Ayrshire, "Knave of Noss" (868).
 4th No. 638 Mungall, William, of Transy, Dunfermline, "Pole Star" (884).
 V No. 636 Mackenzie, R. W. R., of Earlsall, Leuchars, "Viceroy of Anni-ston."
 H No. 635 Mackenzie, R. W. R., of Earlsall, Leuchars, "Whynot of Earlsall" (898).

CLASS 97. ENTIRE COLT, not exceeding 10½ Hands, born in 1921 or 1922.—
 Premiums, £8, £5, £3, and £2.

- 1st No. 642 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "Kitburn of Penniwells."
 2nd No. 644 Mackenzie, R. W. R., of Earlsall, Leuchars, "Express of Anni-ston."
 3rd No. 645 Mungall, William, of Transy, Dunfermline, "Sonyad of Transy."
 4th No. 641 Bibby, Mrs, Sansaw, Shrewsbury, "Heroic of Rossie."
 V No. 646 Robertson, Mrs G., Sandhills, Monkton, Ayrshire, "Peter."
 H No. 647 Taylor, James S., Uphouse, Bressay, Lerwick, "Mermond."

CLASS 98. MARE, not exceeding 10½ Hands, with Foal at foot.—
Premiums, £8, £5, £3, and £2.

- 1st No. 648 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "Heather Belle" (3802).
2nd No. 655 Mackenzie, R. W. R., of Earlsall, Leuchars, "Briar Rose of Earlsall."
3rd No. 658 Mungall, William, of Transy, Dunfermline, "Rosette" (3123).
4th No. 660 Robertson, Mrs G., Sandhills, Monkton, Ayrshire, "Pansy of Fiblistier" (3873).
V No. 651 Kerr, J. E., of Harviestoun, Dollar, "Tiarella" (3591).
H No. 657 Mungall, William, of Transy, Dunfermline, "Sheina of Transy" (2863).
C No. 650 Kerr, J. E., of Harviestoun, Dollar, "Snowdon 2nd" (2947).
C No. 661 Roy, William, St. Ives, Crieff, "Radnor Lucia" (3819).

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 662 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "May Queen of Penniwells" (3348).

CLASS 99. YELD MARE, not exceeding 10½ Hands.—
Premiums, £8, £5, £3, and £2.

- 1st No. 664 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "May Dew of Penniwells" (3347).
2nd No. 671 Mungall, William, of Transy, Dunfermline, "Felecia of Transy" (3945).
3rd No. 674 Robertson, Mrs G., Sandhills, Monkton, Ayrshire, "Enid of Hythe"
4th No. 668 Mackenzie, R. W. R., of Earlsall, Leuchars, "Ruby of Earlsall" (3733).
V No. 667 Kerr, J. E., of Harviestoun, Dollar, "Bagatelle" (2895).
H No. 665 Dunsmore, Buchanan, Comely Bank, Perth, "Wyresdale Cafe" (3964).

CLASS 100. FILLY, not exceeding 10½ Hands, born in 1921 or 1922.—
Premiums, £8, £5, £3, and £2.

- 1st No. 677 Duffus, Mrs Etta, Penniwells, Elstree, Herts, "May Vale of Penniwells."
2nd No. 679 Kerr, J. E., of Harviestoun, Dollar, "Harviestoun Sheila."
3rd No. 681 Robertson, Mrs G., Sandhills, Monkton, "Brilliant of Parkhill."
4th No. 680 Mackenzie, R. W. R., of Earlsall, Leuchars, "Elmo of Earlsall."
V No. 683 Ross, William Hugh, 15 New Street, Rothes, Morayshire.

HORSES IN HARNESS.

PRESIDENT'S CHAMPION MEDAL for best animal in the Classes for Horses in Harness.

- No. 686 Miller, William S., Balmanno Castle, Bridge of Earn, mare, "Stella Vane" (25,386).
Reserve—No. 685 Waddell, Robert, Bridge Street, Dollar, gelding, "Jimmy."

CLASS 101. YELD MARE, FILLY, or GELDING, any age, in Harness, 15 Hands and upwards, to be driven in the ring.—Premiums, £15, £10, and £5.

- 1st No. 685 Waddell, Robert, Bridge Street, Dollar, gelding, "Jimmy."

CLASS 102. YELD MARE, FILLY, or GELDING, any age, in Harness, 14 Hands and under 15, driven in the ring.—Premiums, £15, £10, and £5.

- 1st No. 686 Miller, William S., Balmanno Castle, Bridge of Earn, mare, "Stella Vane" (25,386).

CLASS 103. YELD MARE, FILLY, or GELDING, any age, under 14 Hands, driven in the ring.—Premiums, £8, £5, and £3.

1st No. 689 Miller, William S., Balmanno Castle, Bridge of Earn, mare, "Miss Freda" (25,730).

2nd No. 588 Wardrop, James, 295 High Street, Kirkcaldy, mare, "Harviestoun Roma" (25,530).

JUMPING COMPETITIONS.

Champion Prize of £10 for the most points in Prizes with one or more Horses in Classes 1, 2, and 3.

CONDITIONS.—First Prize to count five points; Second Prize, four points; Third Prize, three points; Fourth Prize, two points; Fifth Prize, one point. The money to be evenly divided in the event of a tie.

Taylor, Joseph, Moss Hall, Stretton, Warrington—14 points.

Wednesday, 16th July.

CLASS 1. HORSE or PONY, any height.—Premiums, £20, £15, £10, £5, and £3.

1st Crawford, Lieut. S. W. K., R.F.A., Buddon Camp, gelding, "Champion Lad."

2nd Taylor, Joseph, Moss Hall, Stretton, Warrington, gelding, "Battleaxe."

3rd Trail, Miss Gladys, Riding Academy, Aberdeen, gelding, "Aviator."

4th Petrie, John, Mains of Dalrulzion, Blairgowrie, gelding, "Joker."

5th Allison, Frank, Newbiggin, Penrith, mare, "Temptress."

Thursday, 17th July.

CLASS 2. HORSE or PONY, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in Class 1.—Premiums, £10, £8, £5, £3, and £2.

1st Allison, Frank, Newbiggin, Penrith, mare, "Temptress."

2nd Craig, Charles, Kincaidston, Ayr "Tom."

3rd Taylor, Joseph, Moss Hall, Stretton, Warrington, gelding, "Cuckoo."

4th Petrie, John, Mains of Dalrulzion, Blairgowrie, gelding, "Joker."

5th Carnegie, R. Y., East Pitcorthie, Kilconquhar, gelding, "Tarzan."

Friday, 18th July.

CLASS 3. HORSE or PONY, any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in either of Classes 1 or 2—4 inches extra for the winner of the two first prizes in Classes 1 and 2.—Premiums, £10, £8, £5, £3, and £2.

1st { Taylor, Joseph, Moss Hall, Stretton, Warrington, gelding, "Cuckoo."

2nd { equal { Taylor, Joseph, Moss Hall, Stretton, Warrington, gelding, "Battleaxe."

3rd { Craig, Charles, Kincaidston, Ayr, "Tom."

4th { Allison, Frank, Newbiggin, Penrith, mare, "Temptress."

5th { equal { Bradley, Ernest, Newton Grange, Great Ayton, mare, "Kitty."

{ Wellburn, W. H., Skelton Manor, York, mare, "Gay Lass."

Thursday Evening, 17th July.

CLASS 4. HORSE or PONY, any height.—Premiums, £10, £8, £5, £3, and £2.

1st Trail, Miss Gladys, Riding Academy, Aberdeen, gelding, "Aviator."

2nd Craig, Charles, Kincaidston, Ayr, "Tom."

3rd Bradley, Ernest, Newton Grange, Great Ayton, mare, "Kitty."

4th Taylor, Joseph, Moss Hall, Stretton, Warrington, gelding, "Battleaxe."

5th Crawford, Lieut. S. W. K., R.F.A., Buddon Camp, gelding, "Champion Lad."

SHEEP

BLACKFACE.

PRESIDENT'S CHAMPION MEDAL for best animal of Blackface breed.

No. 711 Cadzow, Charles, Weston, Dunsyre, "Masterpiece."

Reserve—No. 715 Cadzow, Charles, Weston, Dunsyre.

TUP, entered in Classes 104, 105, and 106, carrying the fleece best adapted for protection, combined with suitability for manufacturing purposes—
Premiums, £5, £3, and £2.

1st No. 737 Mitchell, William, Hazelside, Douglas.

2nd No. 738 Mitchell, William, Hazelside, Douglas.

3rd No. 744 Anderson, W. W., Colzium, Kirknewton.

CLASS 104. TUP above one Shear.—Premiums, £12, £8, £4, and £2.

1st No. 693 Cadzow, Charles, Weston, Dunsyre, "Reality."

2nd No. 701 Hamilton, M. G., Woolfords, Cobbinshaw.

3rd No. 691 Anderson, W. W., Colzium, Kirknewton, "Seldom Seen."

4th No. 698 Duncan, George, of Drumfork, Blairgowrie, "Imperator."

V No. 706 M'Laren, James, Shielbrae, Stirling, "Ringleader."

II No. 694 Cadzow, The Trustees of the late James, Gavinburn, Old Kilpatrick

C No. 707 Mitchell, A. D., West Loch, Eddleston.

EXTRA STOCK.

The following was awarded the Silver Medal :—

No. 711 Cadzow, Charles, Weston, Dunsyre, "Masterpiece."

The following was awarded the Medium Silver Medal :—

No. 712 Mitchell, William, Hazelside, Douglas.

CLASS 105. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

1st No. 715 Cadzow, Charles, Weston, Dunsyre.

2nd No. 727 Hamilton, M. G., Woolfords, Cobbinshaw.

3rd No. 716 Cadzow, Charles, Weston, Dunsyre.

4th No. 728 Hamilton M. G., Woolfords, Cobbinshaw.

V No. 738 Mitchell, William, Hazelside, Douglas.

H No. 722 Clark, James, Crossflatt, Muirkirk.

C No. 726 Duncan, George, of Drumfork, Blairgowrie.

C No. 729 Hamilton, M. G., Woolfords, Cobbinshaw.

C No. 713 Burton, W., Auchtertyre, Tyndrum.

CLASS 106. SHEARLING TUP, which shall have been entirely out-wintered,
 and not housed or house-fed at any time, and not clipped before 22nd May,
 1924.—Premiums, £12, £8, £4, and £2.

1st No. 754 Lindsay, Thomas, Ascreavie, Kirriemuir.

2nd No. 762 Novar Estates, Limited, Novar, Evanton, Ross-shire.

3rd No. 758 Macdonald, James A., Ullar, Aberfeldy.

4th No. 746 Bruges, William, Laighwood, Dunkeld.

V No. 750 Cowan, Alexander, of Loganhouse, Penicuik.

H No. 755 Lindsay, Thomas, Ascreavie, Kirriemuir.

C No. 747 Christie, John F., Netherton, Balfon, Stirlingshire.

C No. 771 Whyte, Archibald, Spott, Kirriemuir.

CLASS 107. EWE, above one Shear, with her Lamb at foot.—
Premiums, £10, £5, and £2.

- 1st No. 780 Novar Estates, Limited, Novar, Evanton, Ross-shire.
2nd No. 778 M'Laren, James, Shielbrae, Stirling.
3rd No. 776 Bruges, William, Laighwood, Dunkeld.
V No. 782 Semple, Andrew, Rosebrae, Mid-Calder.
H No. 774 Anderson, W. W., Colzium, Kirknewton, "Fallside Flower."
C No. 773 Ancaster, The Earl of, Corrychrone, Callander, "Corrychrone Favourite."
C No. 777 Macdonald, James A., Urlar, Aberfeldy.

CLASS 108. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

- 1st No. 794 Lindsay, Thomas, Ascreavie, Kirriemuir.
2nd No. 790 Bruges, William, Laighwood, Dunkeld.
3rd No. 795 Lindsay, Thomas, Ascreavie, Kirriemuir.
V No. 797 M'Laren, James, Shielbrae, Stirling.
H No. 788 Anderson, W. W., Colzium, Kirknewton.
C No. 787 Ancaster, The Earl of, Corrychrone, Callander, "Corrychrone May Dew."

CHEVIOT.

PRESIDENT'S CHAMPION MEDAL for best animal of Cheviot breed.

No. 847 Elliot, John, Blackhaugh, Clovenfords.

Reserve—No. 811 Elliot, Arthur, Hindhope, Jedburgh, "Talisker."

Perpetual Challenge Cup, value £25, gifted by Mr J. Borthwick, for best Sheep in the Cheviot Classes—given by Cheviot Sheep Society.

No. 847 Elliot, John, Blackhaugh, Clovenfords.

CLASS 109. TUP, above one Shear.—Premiums, £12, £8, £4, and £2.

- 1st No. 811 Elliot, Arthur, Hindhope, Jedburgh, "Talisker."
2nd No. 808 Dickson, John Stodart, Flemington, Dolphinton, "Ellemford."
3rd No. 815 Elliot, Thomas R., Attonburn, Yetholm, Kelso.
4th No. 809 Dodd, J. T. & J. J., Riccarton, Newcastleton, "Prohibition."
V No. 812 Elliot, Robert T., Chatto, Kelso.
H No. 813 Elliot, Robert T., Chatto, Kelso.

CLASS 110. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

- 1st No. 832 Linton, George, Pathhead, Dunbar.
2nd No. 823 Elliot, John, Blackhaugh, Clovenfords.
3rd No. 842 Thorburn & Grieve, Glenormiston, Innerleithen, "Excelsior."
4th No. 829 Hogg, William, Newlands, Gifford.
V No. 828 Hogg, George, Penmanshiel, Grantshouse, "Penmanshiel Perfection."
H No. 838 Robson, John, Millknowe, Duns.
C No. 822 Elliot, Arthur, Hindhope, Jedburgh.
C No. 831 Hogg, William, Newlands, Gifford.

CLASS 111. EWE, above one Shear, with her Lamb at foot.—
Premiums, £10, £5, and £2.

- 1st No. 847 Elliot, John, Blackhaugh, Clovenfords.
2nd No. 848 Hogg, William, Newlands, Gifford.
3rd No. 844 Elliot, Arthur, Hindhope, Jedburgh.
V No. 851 Mathison, William, Shoestanes, Heriot, Midlothian.
H No. 855 Robson, John, Millknowe, Duns.
C No. 845 Elliot, Arthur, Hindhope, Jedburgh.

CLASS 112. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

- 1st No. 867 Robson, John, Millknowe, Duns.
 2nd No. 861 Hogg, William, Newlands, Gifford.
 3rd No. 868 Robson, John, Millknowe, Duns.
 V No. 860 Hogg, George, Penmanshiel, Grantshouse, "Lady Perfection."
 H No. 857 Elliot, John, Blackhaugh, Clovenfords.
 C No. 858 Elliot, John, Blackhaugh, Clovenfords.

BORDER LEICESTER.

PRESIDENT'S CHAMPION MEDAL for best animal of Border Leicester Breed.

No. 815 Niven, Alexander, Ayton, Newburgh, Fife.

Reserve—No. 896 Moyes, William Cairns, Renmure, Inverkeilor, "Renmure Expectation."

Paisley Perpetual Gold Challenge Cup, value £300, for best animal of the Border Leicester breed, "Extra Stock" being eligible to compete. This Cup, along with an endowment of £600, was provided from money collected in Paisley by the late Provost Muir MacKean, and is in commemoration of the Society's first Show at Paisley in 1813.

No. 815 Niven, Alexander, Ayton, Newburgh, Fife.

Reserve—No. 896 Moyes, William Cairns, Renmure, Inverkeilor, "Renmure Expectation."

Tweeddale Gold Medal for best Border Leicester Tup—annual free income from fund of £500.

No. 896 Moyes, Wm. Cairns, Renmure, Inverkeilor, "Renmure Expectation."

Gold Medal for best Male animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock-Book. Animals entered as "Extra Stock" not eligible. Given by the Society of Border Leicester Sheep-Breeders.

No. 896 Moyes, Wm. Cairns, Renmure, Inverkeilor, "Renmure Expectation."

CLASS 113. TUP, above one Shear.—Premiums, £12, £8, £4, and £2.

- 1st No. 877 Murray, R. G., & Son, Spittal, Biggar, "Day Dawn" (5957).
 2nd No. 876 Moyes, William Cairns, Renmure, Inverkeilor, "Westside Aristocrat" (5882).
 3rd No. 872 Chalmers, William, Summerfield, Dumfries, "Elevator."
 4th No. 874 M'Intosh, T., Nether Ardargie, Forgandenny, "Craigeassie Aristocrat" (6234).
 V No. 871 Buttars, James, Masterton, Dunfermline, "Young Newmains Knight."
 H No. 873 Macbeth, W. Gilchrist, of Dunira, Comrie, "Stylish Model" (5864).
 C No. 875 Melrose, A. J., Heavyside, Biggar.
 C No. 878 Ross, William R., Balloch of Culloden, Inverness, "Dauntless Culloden" (5952).

CLASS 114. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

- 1st No. 896 Moyes, William Cairns, Renmure, Inverkeilor, "Renmure Expectation."
 2nd No. 908 Whyte, James, Hayston, Glamis.
 3rd No. 886 Kinnaird, John, Papple, Prestonkirk (BL 179).
 4th No. 887 Macbeth, W. Gilchrist, of Dunira, Comrie.
 V No. 884 Elliot, Frank J., Crunklaw, Duns.
 H No. 900 Niven, Alexander, Ayton, Newburgh, Fife.

- C No. 897 Murray, R. G., & Son, Spittal, Biggar.
 C No. 881 Dickinson, R. & W. B., Longcroft, Oxtou, Berwickshire.
 C No. 898 Murray, R. G., & Son, Spittal, Biggar.
 C No. 907 Whyte, James, Hayston, Glamis.

Gold Medal for best Female animal in the Border Leicester Classes, registered or eligible for registration in the Border Leicester Flock-Book. Animals entered as "Extra Stock" not eligible. Given by the Society of Border Leicester Sheep-Breeders.

No. 915 Niven, Alexander, Ayton, Newburgh, Fife.

CLASS 115. EWE, above one Shear.—Premiums, £10, £5, and £2.

- 1st No. 915 Niven, Alexander, Ayton, Newburgh, Fife.
 2nd No. 919 Whyte, James, Hayston, Glamis.
 3rd No. 918 Stewart, Robert C., Newton Farm, Millerhill, Dalkeith.
 V No. 911 Macbeth, W. Gilchrist, of Dunira, Comrie.
 H No. 913 Moyes, William Cairns, Renmure, Inverkeilor.
 C No. 917 Ross, William R., Balloch of Culloden, Inverness.

CLASS 116. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

- 1st No. 941 Young, John, Skerrington Mains, Hurlford.
 2nd No. 922 Dickinson, R. & W. B., Longcroft, Oxtou, Berwickshire.
 3rd No. 934 Niven, Alexander, Ayton, Newburgh, Fife.
 V No. 940 Whyte, James, Hayston, Glamis.
 H No. 926 Macbeth, W. Gilchrist, of Dunira, Comrie.
 C No. 933 Niven, Alexander, Ayton, Newburgh, Fife.
 C No. 931 Moyes, William Cairns, Renmure, Inverkeilor.
 C No. 925 Macbeth, W. Gilchrist, of Dunira, Comrie.
 C No. 921 Dickinson, R. & W. B., Longcroft, Oxtou, Berwickshire.

HALF-BRED.

PRESIDENT'S CHAMPION MEDAL for best Half-bred Animal.

No. 947 Hogg, Adam, Duncanlaw, Gifford.

Reserve—No. 960 Elliot, Frank J., Crunklaw, Duns.

CLASS 117. TUP, above one Shear.—Premiums, £10, £7, and £3.

(No Entry.)

CLASS 118. SHEARLING TUP.—Premiums, £10, £7, and £3.

- 1st No. 947 Hogg, Adam, Duncanlaw, Gifford.
 2nd No. 946 Elliot, John, Blackhaugh, Clovenfords.
 3rd No. 942 Armstrong, Thomas, East Cote, Hawick.
 V No. 945 Elliot, John, Blackhaugh, Clovenfords.
 H No. 948 Hogg, Adam, Duncanlaw, Gifford.

CLASS 119. EWE, above one Shear.—Premiums, £10, £5, and £2.

- 1st No. 949 Dow, W. & J., Brotherstone, St Boswells.
 2nd No. 950 Forteviot, Lord, Dupplin Castle, Perth.
 3rd No. 951 Forteviot, Lord, Dupplin Castle, Perth.

CLASS 120. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

- 1st No. 952 Dodds, William, Clarilaw, St Boswells.
 2nd No. 953 Dodds, William, Clarilaw, St Boswells.

- 3rd No. 954 Dow, W. & J., Brotherstone, St Boswells.
 V No. 955 Dow, W. & J., Brotherstone, St Boswells.
 H No. 956 Forteviot, Lord, Dupplin Castle, Perth.

CLASS 121. THREE EWE LAMBS.—Premiums, £5, £3, and £2.

- 1st No. 960 Elliot, Frank J., Crunklaw, Duns.
 2nd No. 957 Armstrong, Thomas, East Cote, Hawick.
 3rd No. 961 Hogg, Adam, Duncanlaw, Gifford.
 V No. 962 Hogg, George, Penmanshiel, Grantshouse.
 H No. 958 Armstrong, Thomas, East Cote, Hawick.
 C No. 959 Dow, W. & J., Brotherstone, St Boswells.

OXFORD-DOWN.

PRESIDENT'S CHAMPION MEDAL for best Oxford-Down Animal.

- No. 972 Templeton, T. & M., Sandyknowe, Kelso.
Reserve—No. 970 Templeton, T. & M., Sandyknowe, Kelso.

Scottish Oxford-Down Sheep-Breeders' Challenge Cup, value £50, *for the best Oxford-Down animal bred in Scotland*—given by the Oxford-Down Sheep-Breeders' Association.

- No. 972 Templeton, T. & M., Sandyknowe, Kelso.

CLASS 122. SHEARLING TUP.—Premiums, £8, £5, and £3.

- 1st No. 972 Templeton, T. & M., Sandyknowe, Kelso.
 2nd No. 970 Templeton, T. & M., Sandyknowe, Kelso.
 3rd No. 963 Graham, Robert, Kaimflat, Kelso.
 V No. 971 Templeton, T. & M., Sandyknowe, Kelso.
 H No. 964 Graham, Robert, Kaimflat, Kelso.
 C No. 967 Ireland, H. B., Ballindean, Kilmany, Fife, "Ballindean Rufus."

CLASS 123. SHEARLING EWE or GIMMER.—Premiums, £8, £5, and £3.

- 1st No. 979 Templeton, T. & M., Sandyknowe, Kelso.
 2nd No. 978 Templeton, T. & M., Sandyknowe, Kelso.
 3rd No. 974 Graham, Robert, Kaimflat, Kelso.
 V No. 973 Graham, Robert, Kaimflat, Kelso.
 H No. 976 Malcolm, William T., Whittingehame Mains, Prestonkirk.
 C No. 975 Ireland, H. B., Ballindean, Kilmany, Fife.
 C No. 977 Malcolm, William T., Whittingehame Mains, Prestonkirk.

CLASS 124. TUP LAMB.—Premiums, £8, £5, and £3.

- 1st No. 993 Templeton, T. & M., Sandyknowe, Kelso.
 2nd No. 961 Graham, Robert, Kaimflat, Kelso.
 3rd No. 992 Templeton, T. & M., Sandyknowe, Kelso.
 V No. 991 Templeton, T. & M., Sandyknowe, Kelso.
 H No. 986 Ireland, H. B., Ballindean, Kilmany, Fife.
 C No. 988 Malcolm, William T., Whittingehame Mains, Prestonkirk.

CLASS 125. THREE EWE LAMBS.—Premiums, £8, £5, and £2.

- 1st No. 994 Graham, Robert, Kaimflat, Kelso.
 2nd No. 998 Templeton, T. & M., Sandyknowe, Kelso.
 3rd No. 996 Ireland, H. B., Ballindean, Kilmany, Fife.
 V No. 997 Malcolm, William T., Whittingehame Mains, Prestonkirk.

SUFFOLK.

PRESIDENT'S CHAMPION MEDAL for best Suffolk Sheep.

No. 1000 Duncan, John Bryce, Newlands, Dumfries, "Hawk Eagle."
Reserve—No. 1012 Shields, G. Bertram, Dolphingstone, Tranent.

Special Prizes of £7 7s and £3 3s for best and second best group comprising *Tup, Ewe, Tup Lamb, and Ewe Lamb entered in Classes 126, 127, 128, and 129, all to be registered or eligible for registration in the Flock-Book, and, with the exception of the Tup, bred by Exhibitor—given by Mr Dugald M'Kechie, Glasgow.*

1st—Duncan, John Bryce, Newlands, Dumfries (1000, 1006, 1018, 1027).
 2nd—Hogarth, Mrs M. W., Galalaw, Kelso (1002, 1008, 1019, 1028).

CLASS 126. TUP, one Shear and over.—Premiums, £8, £5, and £3.

1st No. 1000 Duncan, John Bryce, Newlands, Dumfries, "Hawk Eagle."

CLASS 127. SHEARLING EWE or GIMMER.—Premiums, £8, £5, and £3.

1st No. 1012 Shields, G. Bertram, Dolphingstone, Tranent.
 2nd No. 1010 Rintoul, William, Kilmux, Leven, Fife, "Lady Anne" (27).
 3rd No. 1008 Hogarth, Mrs M. W., Galalaw, Kelso.
 H No. 1006 Duncan, John Bryce, Newlands, Dumfries.

CLASS 128. TUP LAMB.—Premiums, £8, £5, and £3.

1st No. 1018 Duncan, John Bryce, Newlands, Dumfries.
 2nd No. 1019 Hogarth, Mrs M. W., Galalaw, Kelso.
 3rd No. 1020 Hogarth, Mrs M. W., Galalaw, Kelso.
 H No. 1016 Duncan, Commander J. A., Magungie, Arbroath.
 C No. 1015 Duncan, Commander J. A., Magungie, Arbroath.

CLASS 129. THREE EWE LAMBS.—Premiums, £8, £5, and £2.

1st No. 1026 Duncan, Commander J. A., Magungie, Arbroath.
 2nd No. 1030 Shields, G. Bertram, Dolphingstone, Tranent.
 3rd No. 1028 Hogarth, Mrs M. W., Galalaw, Kelso.
 V No. 1027 Duncan, John Bryce, Newlands, Dumfries.

SHROPSHIRE.

PRESIDENT'S CHAMPION MEDAL for best Shropshire Animal.

No. 1031 Buttar, T. A., Corston, Coupar-Angus.
Reserve—No. 1032 Buttar, T. A., Corston, Coupar-Angus.

CLASS 130. SHEARLING TUP.—Premiums, £8, £4, and £2.

1st No. 1031 Buttar, T. A., Corston, Coupar-Angus.
 2nd No. 1032 Buttar, T. A., Corston, Coupar-Angus.
 3rd No. 1033 Buttar, T. A., Corston, Coupar-Angus.
 V No. 1034 Buttar, T. A., Corston, Coupar-Angus.
 H No. 1035 Grimond, John, Lornty Farm, Blairgowrie, "Cult."
 C No. 1036 Grimond, John, Lornty Farm, Blairgowrie, "Agri."

CLASS 131. SHEARLING EWE or GIMMER.—Premiums, £5, £3, and £2.

1st No. 1039 Buttar, T. A., Corston, Coupar-Angus.
 2nd No. 1038 Buttar, T. A., Corston, Coupar-Angus.
 3rd No. 1040 Buttar, T. A., Corston, Coupar-Angus.
 H No. 1041 Grimond, John, Lornty Farm, Blairgowrie, "Clover."

DORSET HORN.

PRESIDENT'S CHAMPION MEDAL for best Dorset Horn Animal.

No. 1047 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (451).

Reserve—No. 1044 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline.

CLASS 132. TUP, any age.—Premiums, £6, £4, and £2.

1st No. 1044 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline.

2nd No. 1046 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline.

3rd No. 1045 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline.

CLASS 133. EWE or GIMMER.—Premiums, £5, £3, £2.

1st No. 1047 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (451).

2nd No. 1049 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (451).

3rd No. 1048 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (451).

V No. 1050 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (451).

FAT SHEEP.

CLASS 134. THREE FAT LAMBS, any Breed or Cross, dropped in the year of the Show.—Premiums, £5, £3, and £2.

1st No. 1051 Dow, W. & J., Brotherstone, St Boswells (Leicester Tup and Suffolk Ewe).

2nd No. 1052 Dow, W. & J., Brotherstone, St Boswells (Leicester Tup and Suffolk Ewe).

3rd No. 1053 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline (Dorset Horn, 451).

GOATS

PRESIDENT'S CHAMPION MEDAL for best Animal in the Goat Classes.

No. 1057 Forteviot, Lady, Dupplin Castle, Perth (British Alpine), "Riding Taffy" (HB 4783).

Reserve—No. 1066 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Homestall Dream" (HB 5184).

The Competition for Goats is recognised by the British Goat Society, which will give Challenge Certificates (qualifying for a Championship):—

For the best Male Goat over one year.

No. 1057 Forteviot, Lady, Dupplin Castle, Perth (British Alpine), "Riding Taffy" (HB 4783).

For the best Female Goat over two years that has borne a kid.

No. 1066 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Homestall Dream" (HB 5184).

For the best dual purpose Goat.

No. 1066 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Homestall Dream" (HB 5184).

A Breed Challenge Certificate for the best Anglo-Nubian Female Goat over two years that has borne a kid.

No. 1062 Macdonald, Mrs Sydney, Garrochty, Kingarth, Isle of Bute, "Herne Bay Dejah Thoris" (KR 8430, AN 1342).

A Bronze Medal for the best Female exhibit in Classes 138, 139, 140, and 141.

No. 1066 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Homestall Dream" (HB 5184).

A Bronze Medal for the best Male exhibit in Classes 135, 136, and 137.

No. 1059 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Nubian Swiss), "Dupplin Duke" (HB 5879).

Challenge Cup, value 20 Guineas, for the best Female Goat in the Show—given by Lord Dewar, London.

No. 1066 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Homestall Dream" (HB 5184).

Challenge Cup, value £10—for best Female Anglo-Nubian Goat over two years old, in milk, entered in the Anglo-Nubian Section of the Herd-Book, "Extra Stock" being eligible to compete—given by Mrs S. Macdonald, Garrochty.

No. 1062 Macdonald, Mrs Sydney, Garrochty, Kingarth, Isle of Bute, "Herne Bay Dejah Thoris" (KR 8430, AN 1342).

CLASS 135. MALE GOAT, any Variety, over two years.—
Premiums, £3, £2, and £1.

2nd No. 1056 Munro, Miss F. G. R., Hillwood Cottage, Ratho Station, Edinburgh (Anglo-Nubian Swiss), "Hillwood Beauty" (8236).

EXTRA STOCK.

The following was awarded the Silver Medal:—

No. 1057 Forteviot, Lady, Dupplin Castle, Perth (British Alpine), "Riding Taffy" (HB 4783).

CLASS 136. MALE GOAT, any Variety, over one but not exceeding two years.—
Premiums, £3, £2, and £1.

1st No. 1059 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Nubian Swiss),
"Dupplin Duke" (HB 5879).

CLASS 137. MALE KID, any Variety, not exceeding one year.—
Premiums, £3, £2, and £1.

1st No. 1060 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Dupplin
Darius" (HB 6438).

2nd No. 1061 Macdonald, Mrs Sydney, Garrochty, Kingarth, Isle of Bute
(Anglo-Nubian), "Garrochty Pierrot" (AN 1628).

CLASS 138. FEMALE GOAT, Anglo-Nubian, in Milk.
Premiums, £3, £2, and £1.

1st No. 1062 Macdonald, Mrs Sydney, Garrochty, Kingarth, Isle of Bute,
"Herne Bay Dejah Thoris" (KR 8430, AN 1342).

CLASS 139. FEMALE GOAT, any other Variety, in Milk.—
Premiums, £3, £2, and £1.

1st No. 1066 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss) "Home-
stall Dream" (HB 5184).

2nd No. 1065 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Home
stall Dove" (HB 4768).

3rd No. 1068 Graham, Lady Helen, Buchanan Castle, Drymen, Glasgow (Anglo-
Nubian Swiss), "Dusk of Buchanan" (4696).

V No. 1064 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Home-
stall Jet Ash" (HB 3086).

H No. 1067 Graham, Lady Helen, Buchanan Castle, Drymen, Glasgow (Anglo-
Nubian Swiss), "Chocolate of Buchanan" (5034).

C No. 1069 Munro, Miss F. G. R., Hillwood Cottage, Ratho Station, Edin-
burgh (Anglo-Nubian Swiss), "Roughets Mowitch" (4066).

CLASS 140. GOATLING, any Variety, over one but not exceeding two years.—
Premiums, £3, £2, and £1.

1st No. 1072 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Dupplin
Dorothy" (HB 5874).

2nd No. 1070 Blair, Mrs W. E., Abbey View, Causewayhead, Stirling (Anglo-
Nubian Saassen), "Cream Daisy" (HB 6223).

3rd No. 1071 Ewing, Miss Crum, Strathleven, Dumbarton (Anglo-Swiss) "Strath-
leven Drochit" (KR 10,101).

CLASS 141. FEMALE KID, any Variety, not exceeding one year.—
Premiums, £3, £2, and £1.

1st No. 1075 Graham, Lady Helen, Buchanan Castle, Drymen, Glasgow (Anglo-
Nubian Swiss), "Grizel of Buchanan" (6448).

2nd No. 1074 Graham, Lady Helen, Buchanan Castle, Drymen, Glasgow (Anglo-
Nubian Swiss), "Gadabout of Buchanan" (6445).

CLASS 142 MILKING COMPETITION, for quantity, open to Classes 138 and 139.
Premiums, £3, £2, and £1.

1st No. 1068 Forteviot, Lady, Dupplin Castle, Perth (Anglo-Swiss), "Homestall
Dream" (HB 5184).

2nd No. 1068 Graham, Lady Helen, Buchanan Castle, Drymen (Anglo-Nubian
Swiss), "Dusk of Buchanan" (4696).

3rd No. 1067 Graham, Lady Helen, Buchanan Castle, Drymen (Anglo-Nubian
Swiss), "Chocolate of Buchanan" (5034).

PIGS

LARGE WHITE.

PRESIDENT'S CHAMPION MEDAL for best Large White Pig.

No. 1082 Frame, J. & C., Overinzievar, Oakley, Fifeshire, "Broxburn Wonder" (33,143).

Reserve—No. 1116 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Dalmeny Queen" (89,850).

Gold Medal, value £5, for the best Large White Boar in the Show—given by the National Pig-Breeders' Association.

No. 1082 Frame, J. & C., Overinzievar, Oakley, Fifeshire, "Broxburn Wonder" (33,143).

CLASS 143. BOAR, born before 1923.—

Premiums, £8, £4, and £2.

1st No. 1079 Lesslie, William Smith, Banchory, Kirkcaldy, "Banchory Turk" (28,583).

2nd No. 1077 Gammie, John M., Lower Powburn, Fordoun, Kincardineshire, "Histon Lion Heart 7th."

3rd No. 1081 Willis, Mrs R., Kiltane Farm, Dunblane, "Craigcrook King 37th" (36,701).

EXTRA STOCK.

The following was awarded the Silver Medal:—

No. 1082 Frame, J. & C., Overinzievar, Oakley, Fifeshire, "Broxburn Wonder" (33,143).

CLASS 144. BOAR, born in 1923.—

Premiums, £8, £4, and £2.

1st No. 1080 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Dalmeny Mackay."

2nd No. 1081 Wallace, Captain A. A., Halbeath House, Halbeath, Dunfermline, "Bourne King David 27th."

3rd No. 1088 Lesslie, William Smith, Banchory, Kirkcaldy, "Banchory Irresistible 3rd" (Ear No. 71).

H No. 1092 Willis, Mrs R., Kiltane Farm, Dunblane, "Kiltane Emperor."

CLASS 145. BOAR, born in 1924.—

Premiums, £8, £3, and £1.

1st No. 1101 M'Naughton Brothers, Rogerfield, Baillieston (Ear No. 146).

2nd No. 1104 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Dalmeny Victor."

3rd No. 1098 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Benjamin" (Ear No. 285).

V No. 1097 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Benjamin 2nd" (Ear No. 286).

H No. 1094 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh, "Gogar Mathie" (Ear No. 244).

Gold Medal, value £5, for the best Large White Sow in the Show—given by the National Pig-Breeders' Association.

No. 1116 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Dalmeny Queen" (89,850).

CLASS 146. SOW, born before 1923.—

Premiums, £3, £4, and £2.

- 1st No. 1116 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Dalmeny Queen" (89,850).
2nd No. 1111 Frame, J. & C., Overinzievar, Oakley, Fifeshire, "Broxburn
Floweret."
3rd No. 1115 Newbigging, William, Broomvale, Corstorphine, Edinburgh,
"Shawfair Rosedrop" (92,576).
V No. 1110 Frame, J. & C., Overinzievar, Oakley, Fifeshire, "Broxburn Mary
Jane 4th" (77,252).
H No. 1107 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh,
"Dalmeny Jipsey" (66,216).

CLASS 147. SOW, born in 1923.—

Premiums, £3, £4, and £2.

- 1st No. 1126 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Dalmeny Maple-leaf 8th."
2nd No. 1122 Frame, J. & C., Overinzievar, Oakley, Fifeshire, "Broxburn
Elender 2nd."
3rd No. 1121 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Viola 16th"
(Ear No. 188).
V No. 1119 Cowper, John E. B., Gogar Mains, Corstorphine, Edinburgh,
"Gogar Jess" (Ear No. 162).
H No. 1120 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Catalina 7th"
(Ear No. 163).
C No. 1124 Lesslie, William Smith, Banchory, Kirkcaldy, "Banchory Clematis
3rd" (Ear No. 361).

CLASS 148. SOW, born in 1924.—

Premiums, £3, £3, and £1.

- 1st No. 1137 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Dalmeny Sunshine 11th."
2nd No. 1130 Frame, J. & C., Overinzievar, Oakley, Fifeshire, "Broxburn
Floweret 2nd."
3rd No. 1134 M'Naughton Brothers, Rogerfield, Baillieston (Ear No. 148).
V No. 1135 M'Naughton Brothers, Rogerfield, Baillieston (Ear No. 149).
H No. 1128 Forteviot, Lord, Dupplin Castle, Perth, "Dupplin Cinderella"
(Ear No. 289).

MIDDLE WHITE.

PRESIDENT'S CHAMPION MEDAL for best Middle White Pig.

- No. 1147 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Midlothian Reveller."
Reserve—No. 1165 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edin-
burgh, "Midlothian Pet."

Gold Medal, value £5, for the best Middle White Boar in the Show—given by
the National Pig-Breeders' Association.

- No. 1147 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh.
"Midlothian Reveller."

CLASS 149. BOAR, any age.—Premiums, £3, £4, and £2.

- 1st No. 1147 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh,
"Midlothian Reveller."
2nd No. 1146 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh.
"Halbeath Remus."

- 3rd No. 1139 Astor, Lady Violet, Meikleour Pig Herd, Carsis, Blairgowrie, "Victor of Meikleour" (Ear No. 185).
 V No. 1140 Baird, J., & Co. (Falkirk), Limited, Bantaskin, Falkirk, "Norbury Scotty 2nd."
 H No. 1141 Baird, J., & Co. (Falkirk), Limited, Bantaskin, Falkirk, "Bantaskin Chieftain."
 C No. 1138 Arundell, H. W. F. Hunter, Barjarg Tower, Auldgirth, Dumfriesshire, "Chesthill Woodman II." (Ear No. 183).
 C No. 1148 Wallace, Captain A. A., Halbeath House, Halbeath, Dunfermline, "Histon Baron 3rd."

CLASS 150. BOAR, born in 1924.—Premiums, £8, £3, and £1.

- 1st No. 1158 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Midlothian Joe."
 2nd No. 1157 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Midlothian Royal."
 3rd No. 1156 Proctor, Captain A., The Haugh, Blairgowrie, "Captain" (Ear No. 345).
 V No. 1155 Phillips, Duncan, Gladstone Terrace, Stanley, Perthshire.
 C No. 1154 Lindsay, J. C., Rosemount, Blairgowrie, "Victor of Rosemount" (Ear No. 351).
 C No. 1159 Tullibody Land Co., Limited, Brackenbraes Pig Farm, Tullibody, Clackmannanshire, "Menstrie Nogi" (Ear No. 51).

Gold Medal, value £5, for the best Middle White Sow in the Show—given by the National Pig-Breeders' Association.

- No. 1165 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Midlothian Pet."

CLASS 151. SOW, any age.—Premiums, £8, £4, and £2.

- 1st No. 1165 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Midlothian Pet."
 2nd No. 1164 Proctor, Captain A., The Haugh, Blairgowrie, "Chesthill Amethyst" (82,926).
 3rd No. 1162 Lindsay, J. C., Rosemount, Blairgowrie, "Chesthill Clarice 1st" (85,146).
 V No. 1160 Arundell, H. W. F. Hunter, Barjarg Tower, Auldgirth, Dumfriesshire, "Barjarg Betty" (94,368).
 C No. 1163 Phillips, Duncan, Gladstone Terrace, Stanley, Perthshire, "Queen of Stanley 2nd."

CLASS 152. SOW, born in 1924.—Premiums, £6, £3, and £1.

- 1st No. 1177 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Midlothian Pet 2nd."
 2nd No. 1172 Newbigging, William, Broomvale, Corstorphine, Edinburgh.
 3rd No. 1176 Rosebery, The Earl of, K.G., K.T., Dalmeny House, Edinburgh, "Midlothian Rose 18th."
 V No. 1178 Sligo, A. D. S., Inzievar, Oakley, Fife, "Inzievar Dafodil."
 H No. 1174 Proctor, Captain A., The Haugh, Blairgowrie, "Lass of Gowrie" (Ear No. 330).
 C No. 1180 Sligo, A. D. S., Inzievar, Oakley, Fife, "Inzievar Dream."

BERKSHIRE.

PRESIDENT'S CHAMPION MEDAL for best Berkshire Pig.

- No. 1189 Bishop, A. Henderson, Thornton Hall Home Farm, Thorntonhall Station, Glasgow, "Charm" (S 866).

Reserve—No. 1185 Bishop, A. Henderson, Thornton Hall Home Farm, Thorntonhall Station, Glasgow, "Thorntonhall Lurkee" (S 136).

CLASS 153. BOAR, any age.—Premiums, £8, £4, and £2.

- 1st No. 1182 Bishop, A. Henderson, Thornton Hall Home Farm, Thorntonhall Station, Glasgow, "Thorntonhall Bateer."

CLASS 154. BOAR, born in 1924.—Premiums, £8, £3, and £1.

No entry.

CLASS 155. SOW, any age.—Premiums, £8, £4, and £2.

- 1st No. 1185 Bishop, A. Henderson, Thornton Hall Home Farm, Thorntonhall Station, Glasgow, "Thorntonhall Lurkee" (S 138).
2nd No. 1186 Phillips, Duncan, Gladstone Terrace, Stanley, Perthshire.

EXTRA STOCK.

The following was awarded the Silver Medal:—

- No. 1189 Bishop, A. Henderson, Thornton Hall Home Farm, Thorntonhall Station, Glasgow, "Charm" (S 866).

CLASS 156. SOW, born in 1924.—Premiums, £8, £3, and £1.

- 1st No. 1190 Bishop, A. Henderson, Thornton Hall Home Farm, Thorntonhall Station, Glasgow, "Thorntonhall Zorey I."

LARGE BLACK.

PRESIDENT'S CHAMPION MEDAL for best Large Black Pig.

- No. 1230 Duncan, J. Bryce, Newlands, Dumfries, "Newacre Daffodil 1st" (127,096).

- Reserve*—No. 1192 Duncan, J. Bryce, Newlands, Dumfries, "Kedington Magnum" (18,481).

Champion Cup, value £10 10s, for the best Large Black animal exhibited—given by the Large Black Pig Society, "Extra Stock" being eligible to compete.

- No. 1230 Duncan, J. Bryce, Newlands, Dumfries, "Newacre Daffodil 1st" (127,096).

CLASS 157. BOAR, born before 1923.—Premiums, £8, £4, and £2.

- 1st No. 1192 Duncan, J. Bryce, Newlands, Dumfries, "Kedington Magnum" (18,481).
2nd No. 1196 M'Caig & Goodchild, Foreside of Cairn, Kirriemuir, "Maxwell-toun Black Prince 45" (25,021).
3rd No. 1191 Airlie, The Earl of, Cortachy Castle, Kirriemuir, "Docking How D'ye Do" (25,811).
H No. 1195 Frazer, J. & C., Overinzievar, Oakley, Fifeshire, "Coltishall Eagle" (14,075).

CLASS 158. BOAR, born in 1923.—Premiums, £8, £4, and £2.

- 1st No. 1199 Chalmers, William, Logiebride, Bankfoot, "Clevage Logie" (29,271).
2nd No. 1197 Airlie, The Earl of, Cortachy Castle, Kirriemuir, "Cortachy Smuggler."
3rd No. 1204 Tullibody Land Co., Limited, Brackenbraes Pig Farm, Tullibody, Clackmannanshire, "Tullibody Umslopogaas" (30,209).

CLASS 159. BOAR, born in 1924.—Premiums, £8, £3, and £1.

- 1st No. 1208 Duncan, J. Bryce, Newlands, Dumfries, "Newacre Amiable Boy" (A 173).

- 2nd No. 1213 M'Caig & Goodchild, Foreside of Cairn, Kirriemuir, "Yam Extra" (A 149).
 3rd No. 1207 Beaton, James, Hallroom, Guildtown, Perth, "Hallroom Lad" (A 229).
 V No. 1211 Gardner, Major R. D., Achnaclerach Pig Farm, Garve, Ross-shire, "Garve Governor."

CLASS 160. SOW, born before 1923.—Premiums, £8, £4, and £2.

- 1st No. 1222 M'Caig & Goodchild, Foreside of Cairn, Kirriemuir, "Tartar Corinne" (97,918).
 2nd No. 1218 Duncan, J. Bryce, Newlands, Dumfries, "Tartar Daffodil" (90,722).
 3rd No. 1214 Beaton, James, Hallroom, Guildtown, Perth, "Moncreiffe Vane 3rd" (80,852).
 V No. 1219 Duncan, J. Bryce, Newlands, Dumfries, "Newacre Tartarette 2nd" (103,454).
 H No. 1223 Moray, Captain W. A. S. Home Drummond, Abercairney House, Crieff, "Moncreiffe Maud 2nd" (80,862).
 C No. 1221 Holms, Constance E. C., Sandyford, Paisley, "Tinten Daffodil VI." (89,382).

CLASS 161. SOW, born in 1923.—Premiums, £8, £4, and £2.

- 1st No. 1230 Duncan, J. Bryce, Newlands, Dumfries, "Newacre Daffodil 1st" (127,096).
 2nd No. 1228 Beaton, James, Hallroom, Guildtown, Perth, "Hallroom Agnes" (127,574).
 3rd No. 1227 Beaton, James, Hallroom, Guildtown, Perth, "Hallroom Viola" (127,572).
 V No. 1229 Dalgety, Andrew B., Caldhame, Forfar, "Caldhame Darling" (104,234).
 H No. 1233 Phillips, Duncan, Gladstone Terrace, Stanley, Perthshire, "Ward-hall Elfin" (106,444).

CLASS 162. SOW, born in 1924.—Premiums, £6, £3, and £1.

- 1st No. 1239 Duncan, J. Bryce, Newlands, Dumfries, "Newacre Tartaretta" (A 306).
 2nd No. 1246 Tullibody Land Co., Limited, Brackenbraes Pig Farm, Tullibody, Clackmannanshire, "Tullibody Uvinza."
 3rd No. 1245 M'Caig & Goodchild, Foreside of Cairn, Kirriemuir, "Yam Corinne I." (A 234).
 V No. 1243 M'Caig & Goodchild, Foreside of Cairn, Kirriemuir, "Yam Eliza I." (A 228).
 H No. 1244 M'Caig & Goodchild, Foreside of Cairn, Kirriemuir, "Yam Bridget II." (A 230).
 C No. 1237 Beaton, James, Hallroom, Guildtown, Perth, "Hallroom Doreen 3rd" (A 442).

GLOUCESTERSHIRE OLD SPOTS.

PRESIDENT'S CHAMPION MEDAL for the best Gloucestershire Old Spots Pig.

No. 1248 Bendall, Samuel & Reginald, Hotel, Stanley, Perthshire, "Nashes Blossom 13th" (17,727).

Reserve—No. 1249 Bendall, Samuel & Reginald, Hotel, Stanley, Perthshire, "Nashes Duchess 21st."

Silver Challenge Trophy, value 40 Guineas, for best Gloucestershire Old Spots animal—given by the Gloucestershire Old Spots Pig Society, "Extra Stock" being eligible to compete.

No. 1248 Bendall, Samuel & Reginald, Hotel, Stanley, Perthshire, "Nashes Blossom 13th" (17,727).

CLASS 163. BOAR, any age.—Premiums, £8, £4, and £2.

No entry.

CLASS 164. BOAR, born in 1924.—Premiums, £8, £3, and £1.

Not Forward.

CLASS 165. SOW, any age.—Premiums, £8, £4, and £2.

1st No. 1248 Bendall, Samuel & Reginald, Hotel, Stanley, Perthshire, "Nashes Blossom 13th" (17,727).

CLASS 166. SOW, born in 1924.—Premiums, £8, £3, and £1.

1st No. 1249 Bendall, Samuel & Reginald, Hotel, Stanley, Perthshire, "Nashes Duchess 21st."

2nd No. 1250 Phillips, Duncan, Gladstone Terrace, Stanley, Perthshire.

CUMBERLAND.

PRESIDENT'S CHAMPION MEDAL for best Cumberland Pig.

No. 1252 Barron, Jas. R., Findowrie, Brechin, "Findowrie Royal" (BJR, E7).

Reserve—No. 1265 Barron, James R., Findowrie, Brechin, "Findowrie Rose" (BJR, E8).

CLASS 167. BOAR, any age.—Premiums, £8, £4, and £2.

1st No. 1252 Barron, James R., Findowrie, Brechin, "Findowrie Royal" (BJR, E7).

2nd No. 1251 Barron, James R., Findowrie, Brechin, "Findowrie Prize Crop" (BJR, E5).

CLASS 168. BOAR, born in 1924.—Premiums, £8, £3 and £1.

1st No. 1258 Barron, James R., Findowrie, Brechin, "Rover" (BJR, F1).

CLASS 169. SOW, any age.—Premiums, £8, £4, and £2.

1st No. 1265 Barron, James R., Findowrie, Brechin, "Findowrie Rose" (BJR, E8)

2nd No. 1266 Barron, James R., Findowrie, Brechin, "Findowrie Jess" (BJR, E18).

CLASS 170. SOW, born in 1924.—Premiums, £8, £3, and £1.

1st No. 1273 Barron, James R., Findowrie, Brechin, (BJR, F10).

POULTRY

First Premium—*One Sovereign*. Second Premium—*Ten Shillings*. Where there are Four or more Entries, Third Premium—*Five Shillings*.

Champion Challenge Bowl, value £50, for the best exhibit in the Poultry Classes—given by the Proprietors of "The Scottish Poultry News," Aberdeen.

No. 193 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.

CHAMPION MEDALS.

1. *Best Cock, any variety.*

No. 395 Aitkenhead, Charles, Carr House Farm, New Seaham, Co. Durham.

2. *Best Hen, any variety.*

No. 193 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.

3. *Best Cockerel, any variety.*

No. 474 Miller, R. Scott, Clydeneuk Poultry Farm, Uddingston.

4. *Best Pullet, any variety.*

No. 146 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

5. *Best Waterfowl.*

No. 638 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

6. *Best Turkey.*

No. 715 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

CLASS 1. LEGHORN—White. Cock.

1st No. 2 Binnie, William, Garth House, Denny.

2nd No. 3 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.

CLASS 2. LEGHORN—White. Hen.

1st No. 8 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.

2nd No. 7 Binnie, William, Garth House, Denny.

3rd No. 11 Ross, J. C., Stirling Road, Larbert.

V No. 10 Ferries, Robert, Harthill, Countesswells, Aberdeenshire.

H No. 9 Durward, Robert, Bootmaker, Duncricht, Aberdeenshire.

C No. 12 Scott, Alexander, & Sons, Sornhill, Galston.

CLASS 3. LEGHORN—White. Cockerel.

1st No. 15 Binnie, William, Garth House, Denny.

2nd No. 17 Stevenson, Robert, 22 George Place, Peebles.

3rd No. 14 Benson Brothers, Barrhill, Dalbeattie.

V No. 13 Airlie, The Countess of, Cortachy Castle, Kirriemuir.

CLASS 4. LEGHORN—White. Pullet.

1st No. 20 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.

2nd No. 19 Binnie, William, Garth House, Denny.

3rd No. 21 Sinclair, Ian, Fern Cottage, Inverurie.

CLASS 5. LEGHORN—Any other Colour. Cock.

- 1st No. 22 Blackadder, Charles George, Claycroft, Castle Douglas (Black).
 2nd No. 28 Ross, J. C., Stirling Road, Larbert (Brown).
 3rd No. 23 Durward, Robert, Bootmaker, Dunecht, Aberdeenshire (Brown).
 V No. 26 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Buff).
 H No. 24 Ferries, Robert, Harthill, Countesswells, Aberdeenshire (Brown).
 C No. 25 Ferries, Robert, Harthill, Countesswells, Aberdeenshire (Brown).

CLASS 6. LEGHORN—Any other Colour. Hen.

- 1st No. 39 Salmond, James B., The Glen, Glencraig, Fife (Black).
 2nd No. 37 Salmond, James B., The Glen, Glencraig, Fife (Black).
 3rd No. 34 Mealls, David, 15 Shanks Terrace, Dunipace, Denny (Brown).
 V No. 32 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex (Exchequer).
 H No. 31 Brownlie, J. W., Garfield Poultry Yards, Newmains (Black).
 C No. 33 Durward, Robert, Bootmaker, Dunecht, Aberdeenshire (Brown).

CLASS 7. LEGHORN—Any other Colour. Cockerel.

- 1st No. 42 Salmond, James B., The Glen, Glencraig, Fife (Black).
 2nd No. 40 Dewar, The Hon. Irene, Dupplin Castle, Perth (Exchequer).
 3rd No. 41 Salmond, James B., The Glen, Glencraig, Fife (Black).

CLASS 8. LEGHORN—Any other Colour. Pullet.

- 1st No. 46 Salmond, James B., The Glen, Glencraig, Fife (Black).
 2nd No. 45 Salmond, James B., The Glen, Glencraig, Fife (Black).
 3rd No. 44 Durward, Robert, Bootmaker, Dunecht, Aberdeenshire (Brown).

CLASS 9. MINORCA. Cock.

- 1st No. 48 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 2nd No. 47 Binnie, William, Garth House, Denny.
 3rd No. 52 Nelson, Alexander, Craigness, Boglity Road, Kirkcaldy.
 V No. 49 Falconer, A. H., Ballaggan, Gollanfield.
 H No. 50 Kirkwood, James, Blair Smithy, Dalry, Ayrshire.
 C No. 61 Nelson, Alexander, Craigness, Boglity Road, Kirkcaldy.

CLASS 10. MINORCA. Hen.

- 1st No. 53 Binnie, William, Garth House, Denny.
 2nd No. 56 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 3rd No. 60 Nelson, Alexander, Craigness, Boglity Road, Kirkcaldy.
 V No. 58 Ford, James, The Gows Lodge, Invergowrie.
 H No. 62 Sinclair, Ian, Fern Cottage, Inverurie.
 C No. 59 Kirkwood, James, Blair Smithy, Dalry, Ayrshire.

CLASS 11. MINORCA. Cockerel.

- 1st No. 64 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.

CLASS 12. MINORCA. Pullet.

- 1st No. 67 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.

CLASS 13. SCOTCH GREY. Cock.

- 1st No. 73 Watson, William, Cawdor Home Farm, Nairn.
 2nd No. 69 Carswell, John, 148 Grahams Road, Falkirk.
 3rd No. 72 Stewart, James, Woodend Cottage, Whins, Alloa.
 V No. 71 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.
 H No. 70 Carswell, John, 148 Grahams Road, Falkirk.

CLASS 14. SCOTCH GREY. Hen.

- 1st No. 74 Carswell, John, 148 Grahams Road, Falkirk.
 2nd No. 79 Watson, William, Cawdor Home Farm, Nairn.
 3rd No. 76 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.
 V No. 78 Stewart, James, Woodend Cottage, Whins, Alloa.
 H No. 75 Carswell, John, 148 Grahams Road, Falkirk.
 C No. 77 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.

CLASS 15. SCOTCH GREY. Cockerel.

- 1st No. 82 Stewart, James, Woodend Cottage, Whins, Alloa.
 2nd No. 83 Watson, William, Cawdor Home Farm, Nairn.
 3rd No. 81 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.
 V No. 80 Carswell, John, 148 Grahams Road, Falkirk.

CLASS 16. SCOTCH GREY. Pullet.

- 1st No. 85 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.
 2nd No. 84 Carswell, John, 148 Grahams Road, Falkirk.
 3rd No. 86 Stewart, James, Woodend Cottage, Whins, Alloa.
 V No. 87 Watson, William, Cawdor Home Farm, Nairn.

CLASS 17. PLYMOUTH ROCK—Barred. Cock.

- 1st No. 91 Milliken Stock Nurseries, Limited, Johnstone North.
 2nd No. 90 M'Gillivray, James, Mark Farm, Pinwherry.
 3rd No. 88 Argo, Fred, Bructor, Inverurie.
 V No. 93 Morgan, William, Balcurvie, Windygates.
 H No. 92 Milliken Stock Nurseries, Limited, Johnstone North.
 C No. 89 Johnstone, John, Millantae, Lockerbie.

CLASS 18. PLYMOUTH ROCK—Barred. Hen.

- 1st No. 101 Milliken Stock Nurseries, Limited, Johnstone North.
 2nd No. 102 Milliken Stock Nurseries, Limited, Johnstone North.
 3rd No. 94 Argo, Fred, Bructor, Inverurie.
 V No. 103 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.
 H No. 95 Brownlie, Andrew, Hillhead Cottage, Strathaven.
 C No. 87 Johnstone, John, Millantae, Lockerbie.
 C No. 99 Logan, James, East Linton, Prestonkirk.

CLASS 19. PLYMOUTH ROCK—Barred. Cockerel.

- 1st No. 106 Milliken Stock Nurseries, Limited, Johnstone North.
 2nd No. 107 Morgan, William, Balcurvie, Windygates.
 3rd No. 104 Argo, Fred, Bructor, Inverurie.

CLASS 20. PLYMOUTH ROCK—Barred. Pullet.

- 1st No. 110 Milliken Stock Nurseries, Limited, Johnstone North.
 2nd No. 109 MacLaren, Thomas, School House, Newton Mearns.

CLASS 21. PLYMOUTH ROCK—Any other Colour. Cock or Cockerel.

- 1st No. 114 Milliken Stock Nurseries, Limited, Johnstone North (Cock, Buff).
 2nd No. 113 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Cock, Buff).
 3rd No. 111 Argo, Fred, Bructor, Inverurie (Cock, White).
 V No. 112 Dewar, The Hon. Irene, Dupplin Castle, Perth (Cockerel, Buff).

CLASS 22. PLYMOUTH ROCK—Any other Colour. Hen or Pullet.

- 1st No. 119 Milliken Stock Nurseries, Limited, Johnstone North (Hen, White).
 2nd No. 118 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex (Hen, White).

- 3rd No. 115 Argo, Fred, Bructor, Inverurie (Hen, White).
 V No. 117 Dewar, The Hon. Irene, Dupplin Castle, Perth (Pullet, Buff).
 H No. 116 Baird, Mrs G., Colstoun, Haddington (Hen, Columbian).

CLASS 23. ORPINGTON—Black. Cock.

- 1st No. 120 Baird, Mrs G., Colstoun, Haddington.
 2nd No. 122 Chrystal, William, Inverboyndie, Banff.
 3rd No. 124 Milliken Stock Nurseries, Limited, Johnstone North.
 V No. 123 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 H No. 121 Burdett, John, Lake Bank Terrace, Wingate, Durham.
 C No. 125 Thorburn & Steel, 36 High Street, Lockerbie.

CLASS 24. ORPINGTON—Black. Hen.

- 1st No. 126 Baird, Mrs G., Colstoun, Haddington.
 2nd No. 127 Burdett, John, Lake Bank Terrace, Wingate, Durham.
 3rd No. 129 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 128 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

CLASS 25. ORPINGTON—Black. Cockerel.

- 1st No. 132 Burdett, John, Lake Bank Terrace, Wingate, Durham.
 2nd No. 131 Baird, Mrs G., Colstoun, Haddington.

CLASS 26. ORPINGTON—Black. Pullet.

- 1st No. 134 Burdett, John, Lake Bank Terrace, Wingate, Durham.
 2nd No. 135 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 V No. 133 Baird, Mrs G., Colstoun, Haddington.

CLASS 27. ORPINGTON—Buff. Cock.

- 1st No. 138 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 2nd No. 136 Argo, Fred, Bructor, Inverurie.
 3rd No. 139 Reid, William, & Son, Hallcraig House, Airdrie.
 V No. 137 Heggie, Lyall M., Cotton Ovenstone, Kirkbuddo.

CLASS 28. ORPINGTON—Buff. Hen.

- 1st No. 142 Milliken Stock Nurseries, Limited, Johnstone North.
 2nd No. 141 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 3rd No. 143 Reid, William, & Son, Hallcraig House, Airdrie.

CLASS 29. ORPINGTON—Buff. Cockerel.

- 1st No. 144 Heggie, Lyall M., Cotton Ovenstone, Kirkbuddo.

CLASS 30. ORPINGTON—Buff. Pullet.

- 1st No. 146 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

CLASS 31. ORPINGTON—White. Cock.

- 1st No. 147 Baird, Mrs G., Colstoun, Haddington.
 2nd No. 148 Thorburn & Steel, 36 High Street, Lockerbie.

CLASS 32. ORPINGTON—White. Hen.

- 1st No. 150 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 2nd No. 149 Baird, Mrs G., Colstoun, Haddington.
 V No. 151 Thorburn & Steel, 36 High Street, Lockerbie.

CLASS 33. ORPINGTON—White. Cockerel.

(No Entry).

CLASS 34. ORPINGTON—White. Pullet.

1st No. 152 Baird Mrs G., Colstoun, Haddington.

CLASS 35. WYANDOTTE—Gold or Silver. Cock.

1st No. 158 Morgan, William, Balcurvie, Windygates (Gold).
 2nd No. 155 M'Crone, Robert, Poundland, Dunscore (Silver).
 3rd No. 159 Richardson, William, 13 Bootham Crescent, York (Gold-laced).
 V No. 156 M'Crone, Robert, Poundland, Dunscore (Silver).
 H No. 157 M'Millan, Robert, Forty Acres Poultry Farm, Kilmarnock (Gold).
 C No. 160 Robertson Brothers, 23 Sluice Burn, Kinross (Gold-laced).

CLASS 36. WYANDOTTE—Gold or Silver. Hen.

1st No. 163 Morgan, William, Balcurvie, Windygates (Gold).

CLASS 37. WYANDOTTE, Gold or Silver. Cockerel.

1st No. 165 Morgan, William, Balcurvie, Windygates (Gold).
 2nd No. 166 Philipson, J. M., Wyandotte Farm, Gilsland, Carlisle (Silver-laced).
 3rd No. 167 Philipson, J. M., Wyandotte Farm, Gilsland, Carlisle (Silver-laced).
 V No. 168 Richardson, William, 13 Bootham Crescent, York (Gold-laced).

CLASS 38. WYANDOTTE, Gold or Silver. Pullet.

1st No. 172 Morgan, William, Balcurvie, Windygates (Gold).
 2nd No. 171 Miller, R. Scott, Clydeneuk Poultry Farm, Uddingston (Silver-laced).
 3rd No. 174 Philipson, J. M., Wyandotte Farm, Gilsland, Carlisle (Silver-laced).
 V No. 173 Philipson, J. M., Wyandotte Farm, Gilsland, Carlisle (Silver-laced).

CLASS 39. WYANDOTTE—White. Cock.

1st No. 178 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 2nd No. 186 Morgan, William, Balcurvie, Windygates.
 3rd No. 189 Williamson Brothers, East Lochran, Blairadam.
 V No. 187 Robertson Brothers, 23 Sluice Burn, Kinross.
 H No. 184 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 C No. 188 Weir, John, Midtown, New Abbey Road, Dumfries.

CLASS 40. WYANDOTTE—White. Hen.

1st No. 193 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 2nd No. 199 Weir, John, Midtown, New Abbey Road, Dumfries.
 3rd No. 197 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 198 Morgan, William, Balcurvie, Windygates.
 H No. 200 Williamson Brothers, East Lochran, Blairadam.
 C No. 192 Binnie, William, Garth House, Denny.

CLASS 41. WYANDOTTE—White. Cockerel.

1st No. 205 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 2nd No. 208 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 3rd No. 209 Ross, Alexander, Newmill, Tibbermore, Perth.
 V No. 203 Brown, A. M'Kenzie, Stanehead Poultry Farm, Biggar.
 H No. 206 Falconer, A. H., Ballaggan, Gollanfield.

CLASS 42. WYANDOTTE—White. Pullet.

1st No. 212 Binnie, William, Garth House, Denny.
 2nd No. 213 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 3rd No. 216 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 219 Ross, Alexander, Newmill, Tibbermore, Perth.
 H No. 214 Falconer, A. H., Ballaggan, Gollanfield.
 C No. 211 Abbott, Norman F., Myrekirk, Liff, Forfarshire.

CLASS 43. WYANDOTTE—Partridge. Cock or Cockerel.

- 1st No. 222 Brown, Charles, Ivybank, Kintore (Cock).
2nd No. 223 Reid, William, & Son, Halleraig House, Airdrie (Cock).

CLASS 44. WYANDOTTE—Partridge. Hen or Pullet.

- 1st No. 225 Argo, Fred, Bructor, Inverurie (Hen).
2nd No. 227 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Hen).
3rd No. 229 Reid, William, & Son, Halleraig House, Airdrie (Hen).
V No. 226 Boardley, J. A., Slyne Road, Lancaster (Hen).
H No. 228 Milliken Stock Nurseries, Limited, Johnstone North (Hen).
C No. 224 Argo, Fred, Bructor, Inverurie (Hen).

CLASS 45. WYANDOTTE—Any other Colour. Cock or Cockerel.

- 1st No. 230 Braid, George, Kennoway Burns, Windygates (Cock, Black).
2nd No. 232 Miller, Thomas, 113 North Glencraig, Fife (Cock, Black).
3rd No. 233 Reid, William, & Son, Halleraig House, Airdrie (Cock, Black).

CLASS 46. WYANDOTTE—Any other Colour. Hen or Pullet.

- 1st No. 235 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Hen, Blue).
2nd No. 236 Reid, William, & Sons, Halleraig House, Airdrie (Hen, Black).
V No. 234 Braid, George, Kennoway Burns, Windygates (Hen, Black).

CLASS 47. RHODE ISLAND RED. Cock.

- 1st No. 252 M'Gillivray, James, Mark Farm, Pinwherry.
2nd No. 254 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
3rd No. 245 Bisset, Alexander, Knowe Head, Freuchie.
V No. 261 Southam, Christopher C., Leicester Road, Bedworth, Nuneaton.
H No. 262 Spence, David C., School House, Bonnybridge.
C No. 241 Bauer, E. F., Wheatfield, Craigentinny, Edinburgh.
C No. 246 Brown, Charles, Ivybank, Kintore.
C No. 255 Milne, George, The Cross, Whitburn.
C No. 268 Wilson, James, Redvers Oak, Tranzy Place, Dunfermline.

CLASS 48. RHODE ISLAND RED. Hen.

- 1st No. 281 Meek, Robert, Whitburn, West Lothian.
2nd No. 282 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
3rd No. 274 Bell, Dr. A. L., Ballochmyle House, Dunfermline.
V No. 288 Shanks, Thomas, 10 Mill Road, Bathgate.
H No. 284 Petrie, Alexander, Airth Station, Larbert.
C No. 275 Bisset, Alexander, Knowe Head, Freuchie.

CLASS 49. RHODE ISLAND RED. Cockerel.

- 1st No. 298 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
2nd No. 294 Bell, Dr. A. L., Ballochmyle House, Dunfermline.
3rd No. 300 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
V No. 306 White, John H., Hawthorns Lodge, Galashiels.
H No. 302 Petrie, Alexander, Airth Station, Larbert.
C No. 305 Stewart, Alexander, Hotel, Balbeggie, Perth.

CLASS 50. RHODE ISLAND RED. Pullet.

- 1st No. 320 Robertson, John, Craigend, Dundas Castle, South Queensferry.
2nd No. 315 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
3rd No. 310 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
V No. 307 Bell, Dr. A. L., Ballochmyle House, Dunfermline.

- H No. 317 Petrie, Alexander, Airth Station, Larbert.
 C No. 318 Petrie, Alexander, Airth Station, Larbert.
 C No. 322 White, John H., Hawthorns Lodge, Galashiels.

CLASS 51. SUSSEX—Light. Cock.

- 1st No. 324 Baird, Mrs G., Colstoun, Haddington.
 2nd No. 325 Grant, Mrs M. A., Westlands, Horley, Surrey.
 3rd No. 328 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 331 Stewart, Duncan M., Millhills, Crieff.
 H No. 327 Logan, James, East Linton, Prestonkirk.
 C No. 332 Urquhart, Joseph, Skiddaw, Annan.

CLASS 52. SUSSEX—Light. Hen.

- 1st No. 334 Baird, Mrs G., Colstoun, Haddington.
 2nd No. 342 Sinclair, Ian, Fern Cottage, Inverurie.
 3rd No. 336 Grant, Mrs M. A., Westlands, Horley, Surrey.
 V No. 341 Scott, J. G., Congalton, Drem.
 H No. 338 Johnstone, John, Millantae, Lockerbie.
 C No. 339 Johnstone, John, Millantae, Lockerbie.

CLASS 53. SUSSEX—Light. Cockerel.

- 1st No. 344 Baird, Mrs G., Colstoun, Haddington.
 2nd No. 345 Grant, Mrs M. A., Westlands, Horley, Surrey.
 3rd No. 346 Miller, R. Scott, Clydeneuk Poultry Farm, Uddingston.
 V No. 347 White, John H., Hawthorns Lodge, Galashiels.

CLASS 54. SUSSEX—Light. Pullet.

- 1st No. 348 Baird, Mrs G., Colstoun, Haddington.
 2nd No. 352 Miller, R. Scott, Clydeneuk Poultry Farm, Uddingston.
 3rd No. 354 White, John H., Hawthorns Lodge, Galashiels.
 V No. 350 Grant, Mrs M. A., Westlands, Horley, Surrey.
 H No. 353 Reid, William, & Son, Hallcraig House, Airdrie.
 C No. 349 Carr, Tom, Keswick House, Annan.

CLASS 55. SUSSEX—Any other Variety. Cock.

- 1st No. 357 Milliken Stock Nurseries, Limited, Johnstone North (Speckled).
 2nd No. 355 Grant, Mrs M. A., Westlands, Horley, Surrey (Speckled).
 3rd No. 356 Grant, Mrs M. A., Westlands, Horley, Surrey (Brown).

CLASS 56. SUSSEX—Any other Variety. Hen.

- 1st No. 362 Milliken Stock Nurseries, Limited, Johnstone North (Speckled).
 2nd No. 359 Baird, Mrs G., Colstoun, Haddington (Speckled).
 3rd No. 361 Grant, Mrs M. A., Westlands, Horley, Surrey (Red).
 V No. 360 Grant, Mrs M. A., Westlands, Horley, Surrey (Speckled).
 H No. 363 Milne, George, The Cross, Whitburn (Speckled).

CLASS 57. SUSSEX—Any other Variety. Cockerel.

- 1st No. 365 Grant, Mrs M. A., Westlands, Horley, Surrey (Speckled).
 2nd No. 366 Grant, Mrs M. A., Westlands, Horley, Surrey (Red).

CLASS 58. SUSSEX—Any other Variety. Pullet.

- 1st No. 369 Grant, Mrs M. A., Westlands, Horley, Surrey (Red).
 2nd No. 368 Grant, Mrs M. A., Westlands, Horley, Surrey (Speckled).

CLASS 59. DORKING—Coloured. Cock.

- 1st No. 373 Rogers, James, Forneth, Blairgowrie.
 2nd No. 370 Aitkenhead, Charles, Carr House Farm, New Seaham, Co. Durham.
 3rd No. 372 Mechie, John, Burnside, Auchtermuchty.
 V No. 371 Cathcart, Colonel J. T., of Pitcairrie, Newburgh.

CLASS 60. DORKING—Coloured. Hen.

- 1st No. 374 Aitkenhead, Charles, Carr House Farm, New Seaham, Co. Durham.
- 2nd No. 378 Mechie, John, Burnside, Auchtermuchty.
- 3rd No. 379 Rogers, James, Forneth, Blairgowrie.
- V No. 377 Cathcart, Colonel J. T., of Pitcairrie, Newburgh.

CLASS 61. DORKING—Coloured. Cockerel.

- 1st No. 385 Sneddon, C., 30 Station Road, Wesham, Kirkham.
- 2nd No. 383 Mechie, John, Burnside, Auchtermuchty.
- 3rd No. 384 Rogers, James, Forneth, Blairgowrie.
- V No. 382 Major, A. J., Ditton, Langley, Buckinghamshire.

CLASS 62. DORKING—Coloured. Pullet.

- 1st No. 394 Sneddon, C., 30 Station Road, Wesham, Kirkham.
- 2nd No. 393 Smythe, John Acheson, The Lodge, Coleraine.
- 3rd No. 391 Rogers, James, Forneth, Blairgowrie.
- V No. 389 Major, A. J., Ditton, Langley, Buckinghamshire.
- C No. 392 Rogers, James, Forneth, Blairgowrie.

CLASS 63. DORKING—Silver Grey. Cock

- 1st No. 395 Aitkenhead, Charles, Carr House Farm, New Seaham, Co. Durham.
- 2nd No. 397 Mechie, John, Burnside, Auchtermuchty.
- 3rd No. 398 Bryce, William, Snaigow, Murthly.
- V No. 398 Rogers, James, Forneth, Blairgowrie.
- C No. 399 Sinclair, Ian, Fern Cottage, Inverurie.

CLASS 64. DORKING—Silver Grey. Hen.

- 1st No. 404 Mechie, John, Burnside, Auchtermuchty.
- 2nd No. 405 Mechie, John, Burnside, Auchtermuchty.
- 3rd No. 406 Rogers, James, Forneth, Blairgowrie.
- V No. 400 Aitkenhead, Charles, Carr House Farm, New Seaham, Co. Durham.
- H No. 403 Bryce, William, Snaigow, Murthly.

CLASS 65. DORKING—Silver Grey. Cockerel.

- 1st No. 411 Major, A. J., Ditton, Langley, Buckinghamshire.
- 2nd No. 410 Guthrie, Alexander, Craigs Forge, Montrose.
- 3rd No. 412 Mechie, John, Burnside, Auchtermuchty.
- V No. 413 Rogers, James, Forneth, Blairgowrie.

CLASS 66. DORKING—Silver Grey. Pullet.

- 1st No. 420 Mechie, John, Burnside, Auchtermuchty.
- 2nd No. 419 Major, A. J., Ditton, Langley, Buckinghamshire.
- 3rd No. 421 Rogers, James, Forneth, Blairgowrie.
- V No. 418 Guthrie, Alexander, Craigs Forge, Montrose.

CLASS 67. SCOTS DUMPY. Cock.

- 1st No. 423 Kerr, J. E., of Harviestoun, Dollar.
- 2nd No. 425 Kerr, J. E., of Harviestoun, Dollar.
- 3rd No. 424 Kerr, J. E., of Harviestoun, Dollar.
- V No. 427 Major, A. J., Ditton, Langley, Buckinghamshire.
- H No. 422 Brown, James W., Skellyton Farm, Larkhall.
- C No. 426 Major, A. J., Ditton, Langley, Buckinghamshire.
- C No. 429 Stewart, Alexander, Hotel, Balbeggie, Perth.

CLASS 68. SCOTS DUMPY. Hen.

- 1st No. 433 Kerr, J. E., of Harviestoun, Dollar.
- 2nd No. 432 Kerr, J. E., of Harviestoun, Dollar.
- 3rd No. 430 Brown, James W., Skellyton Farm, Larkhall.

- V No. 431 Kerr, J. E., of Harviestoun, Dollar.
 H No. 437 Ribbons, Pat., Clunie, Newburgh.
 C No. 434 Major, A. J., Ditton, Langley, Buckinghamshire.
 C No. 435 Major, A. J., Ditton, Langley, Buckinghamshire.

CLASS 69. SCOTS DUMPY. Cockerel.

- 1st No. 439 Kerr, J. E., of Harviestoun, Dollar.
 2nd No. 440 Kerr, J. E., of Harviestoun, Dollar.

CLASS 70. SCOTS DUMPY. Pullet.

- 1st No. 441 Kerr, J. E., of Harviestoun, Dollar.
 2nd No. 442 Kerr, J. E., of Harviestoun, Dollar.

CLASS 71. INDIAN GAME. Cock.

- 1st No. 444 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 2nd No. 448 Malcolm, Maurice, Boromeadow, Stirling.
 3rd No. 446 Girdwood, Gavin, Drumrossie, Ayr.
 V No. 449 Malcolm, Maurice, Boromeadow, Stirling.
 C No. 447 Girdwood, Gavin, Drumrossie, Ayr.

CLASS 72. INDIAN GAME. Hen.

- 1st No. 453 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 2nd No. 454 Douglas, Francis J. B., Redlairdston, Buchlyvie.
 3rd No. 455 Douglas, Francis J. B., Redlairdston, Buchlyvie.
 V No. 457 Douglas, Francis J. B., Redlairdston, Buchlyvie.
 H No. 463 Malcolm, Maurice, Boromeadow, Stirling.
 C No. 456 Douglas, Francis J. B., Redlairdston, Buchlyvie.
 C No. 459 Girdwood, Gavin, Drumrossie, Ayr.
 C No. 465 Scott, Hugh, 1 Orangefield Place, Greenock.

CLASS 73. INDIAN GAME. Cockerel.

- 1st No. 474 Miller, R. Scott, Clydeneuk Poultry Farm, Uddingston.
 2nd No. 468 Dodd, George E., Hillside, Burwardsby, Chester.
 3rd No. 475 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 V No. 469 Douglas, Francis J. B., Redlairdstone, Buchlyvie.
 H No. 472 Malcolm, Maurice, Boromeadow, Stirling.
 C No. 473 Malcolm, Maurice, Boromeadow, Stirling.

CLASS 74. INDIAN GAME. Pullet.

- 1st No. 477 Douglas, Francis J. B., Redlairdston, Buchlyvie.
 2nd No. 478 Douglas, Francis J. B., Redlairdston, Buchlyvie.
 3rd No. 482 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 V No. 481 Miller, R. Scott, Clydeneuk Poultry Farm, Uddingston.

CLASS 75. GAME—Old English. Cock.

- 1st No. 492 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 2nd No. 485 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 3rd No. 493 Stewart, Duncan M., Millhills, Crieff.
 V No. 488 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 H No. 487 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 C No. 491 Smithson, Mrs. Black, Lion Hotel, Ireby, Carlisle.

CLASS 76. GAME—Old English. Hen.

- 1st No. 500 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 2nd No. 496 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 3rd No. 498 Russell, H. N. & H. T., Newton Holme, Kirkbride, Carlisle.
 V No. 497 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 H No. 495 Bonthron, Peter, 24 Arthur Street, Cowdenbeath.
 C No. 494 Bonthron, Peter, 24 Arthur Street, Cowdenbeath.
 C No. 501 Stewart, Duncan M., Millhills, Crieff.

CLASS 77. GAME—Old English. Cockerel.

- 1st No. 508 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 2nd No. 503 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 3rd No. 502 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 V No. 504 Russell, H. N. & H. T., Newton Holme, Kirkbride, Carlisle.

CLASS 78. GAME—Old English. Pullet.

- 1st No. 508 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 2nd No. 507 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 V No. 508 Reed, William Graham, Low Cote Hill Farm, Carlisle.

CLASS 79. BANTAM—Game. Cock.

- 1st No. 514 Lindsay, Miss Lizzie Low, Coaltown, Markinch.
 2nd No. 520 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 3rd No. 512 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 V No. 510 Anderson & Adamson, Sandport, Kinross.
 H No. 515 Reed, William Graham, Low Cote Hill Farm, Carlisle.
 C No. 518 Shepherd, Alexander, Lily Cottage, Forfar.

CLASS 80. BANTAM—Game. Hen.

- 1st No. 525 Lindsay, Miss Lizzie Low, Coaltown, Markinch.
 2nd No. 531 Sneddon, C., 30 Station Road, Wesham, Kirkham.
 3rd No. 523 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex.
 V No. 532 Wilson, James, Redvers Oak, Transy Place, Dunfermline.
 H No. 530 Shepherd, Alexander, Lily Cottage, Forfar.
 C No. 522 Craig, Robert, East Crown House, Inverness.

CLASS 81. BANTAM—Other than Game. Cock.

- 1st No. 537 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex (Rosecomb Black).
 2nd No. 538 Binnie, William, Garth House, Denny (Wyandotte White).
 3rd No. 541 M'Howat, Robert, Muckcroft, Lennoxtown (Pekin Black).
 V No. 533 Anderson & Adamson, Sandport, Kinross (Indian Game).
 H No. 540 Lindsay, Miss Lizzie Low, Coaltown, Markinch (Rosecomb White).
 C No. 534 Anderson & Adamson, Sandport, Kinross (Indian Game).
 C No. 535 Anderson & Fairgrieve, Montgomery Street, Kinross (Indian).
 C No. 542 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Wyandotte).
 C No. 544 Reid, William, & Son, Hallcraig House, Airdrie (Wyandotte Black).
 C No. 545 Salmond, James B., The Glen, Glencraig, Fife (Rosecomb Black).
 C No. 546 Sneddon Brothers, Junction Road, Kinross (Pekin Black).
 C No. 547 Stewart, James, Woodend Cottage, Whins, Alloa (Scots Grey).
 C No. 548 Williamson Brothers, East Lochran, Blairadam (Wyandotte White).

CLASS 82. BANTAM—Other than Game. Hen.

- 1st No. 556 Dewar, Lord, Homestall Poultry Farm, East Grinstead, Sussex (Wyandotte White).
 2nd No. 561 M'Howat, Robert, Muckcroft, Lennoxtown (Pekin Black).
 3rd No. 553 Binnie, William, Garth House, Denny (Wyandotte White).
 V No. 568 Williamson Brothers, East Lochran, Blairadam (Wyandotte White).
 H No. 565 Sneddon Brothers, Junction Road, Kinross (Pekin Black).
 C No. 552 Anderson & Fairgrieve, Montgomery Street, Kinross (Indian).
 C No. 554 Brownlie, J. W., Garfield Poultry Yards, Newmains (Sebright Golden).
 C No. 560 Lindsay, Miss Lizzie Low, Coaltown, Markinch (Rosecomb Black).

- C No. 562 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Wyandotte).
 C No. 563 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock (Pekin Black).

CLASS 83. BANTAM—Any Variety. Cockerel.

- 1st No. 573 Williamson Brothers, East Lochran, Blairadam (Wyandotte White).
 2nd No. 571 Shepherd, Alexander, Lily Cottage, Forfar (Modern Game).
 3rd No. 572 Sneddon, C., 30 Station Road, Wesham, Kirkham (Modern Game).

CLASS 84. BANTAM—Any Variety. Pullet.

- 1st No. 580 Sneddon, C., 30 Station Road, Wesham Kirkham (Modern Game).
 2nd No. 579 Shepherd, Alexander, Lily Cottage, Forfar (Modern Game).
 3rd No. 578 Ellwood, Joseph W., Papcastle, Cockermouth (Indian Game).
 V No. 574 Binnie, William, Garth House, Denny (Wyandotte White).

CLASS 85. ANY OTHER RECOGNISED BREED. Cock.

- 1st No. 593 Sneddon, C., 30 Station Road, Wesham, Kirkham (Modern Game).
 2nd No. 590 M'Vicar, Daniel, Crosshill, Lennoxton (Poland Gold).
 3rd No. 594 Wilson, James, Redvers Oak, Transy Place, Dunfermline (Langshan Black).
 V No. 589 M'Vicar, Daniel, Crosshill, Lennoxton (Poland Gold).
 H No. 584 Bruce, John, Allanfean, Inverness (Campine Silver).
 C No. 583 Baird, Mrs G., Colstoun, Haddington (Brahma Dark).
 C No. 585 Bruce, John, Allanfean, Inverness (Campine Gold).
 C No. 592 Sinclair, Ian, Fern Cottage, Inverurie (Brahma Light).

CLASS 86. ANY OTHER RECOGNISED BREED. Hen.

- 1st No. 609 Sneddon, C., 30 Station Road, Wesham, Kirkham (Modern Game).
 2nd No. 605 Ross, J. C., Stirling Road, Larbert (Hamburg Gold).
 3rd No. 602 M'Vicar, Daniel, Crosshill, Lennoxton (Poland Gold).
 V No. 603 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.
 C No. 597 Craig, Robert, East Crown House, Inverness (Brahma Dark).
 C No. 600 Hay, J. D., of Glenearn, Bridge of Earn (Silkie White).
 C No. 601 M'Vicar, Daniel, Crosshill, Lennoxton (Poland Gold).

CLASS 87. ANY OTHER RECOGNISED BREED. Cockerel.

- 1st No. 610 Reid, William, & Son, Hallcraig House, Airdrie (Ancona).
 2nd No. 611 Sinclair, Ian, Fern Cottage, Inverurie (Brahma Light).
 3rd No. 613 Sneddon, C., 30 Station Road, Wesham, Kirkham (Ancona).

CLASS 88. ANY OTHER RECOGNISED BREED. Pullet.

- 1st No. 617 Sneddon, C., 30 Station Road, Wesham, Kirkham (Ancona).
 2nd No. 615 Miller, R. Scott, Clydeneuk Poultry Farm, Uddingston (Cochin Partridge).
 3rd No. 614 Baird, Mrs G., Colstoun, Haddington (Orloff).

CLASS 89. CROSS-BRED FOWLS FOR LAYING PURPOSES. Hen.

- 1st No. 620 Morgan, William, Balcurvie, Windygates.
 2nd No. 622 Reid, William, & Son, Hallcraig House, Airdrie.
 3rd No. 621 Ramsay, William, Muirhouse Cottage, Crosshouse, Kilmarnock.
 V No. 618 M'Millan, Robert, Forty Acres Poultry Farm, Kilmarnock.

CLASS 90. CROSS-BRED FOWLS FOR LAYING PURPOSES. Pullet.

- 1st No. 627 Morgan, William, Balcurvie, Windygates.
 2nd No. 625 M'Millan, Robert, Forty Acres Poultry Farm, Kilmarnock.
 3rd No. 626 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 629 Reid, William, & Sons, Hallcraig House, Airdrie.

CLASS 91. DUCKS—Aylesbury. Drake.

- 1st No. 631 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 632 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 633 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

CLASS 92. DUCKS—Aylesbury. Duck.

- 1st No. 636 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 635 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 637 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

CLASS 93. DUCKS—Aylesbury. Drake (Young).

- 1st No. 638 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 639 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 V No. 640 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

CLASS 94. DUCKS—Aylesbury. Duck (Young).

- 1st No. 641 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 642 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.

CLASS 95. DUCKS—Orpington. Drake.

- 1st No. 646 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 645 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 648 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 647 Maxwell, The Hon. Mrs. Farlie House, Beaulieu.

CLASS 96. DUCKS—Orpington. Duck.

- 1st No. 649 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 650 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 652 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 651 Maxwell, The Hon. Mrs. Farlie House, Beaulieu.

CLASS 97. DUCKS—Orpington. Drake (Young).

- 1st No. 653 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 654 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 V No. 655 Maxwell, The Hon. Mrs. Farlie House, Beaulieu.

CLASS 98. DUCKS—Orpington. Duck (Young).

- 1st No. 658 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 657 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 3rd No. 659 Maxwell, The Hon. Mrs. Farlie House, Beaulieu.
 V No. 660 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 C No. 656 Dalgleish, James P., West Grange, East Grange Station, Dunfermline.

CLASS 99. DUCKS—Indian Runner. Drake.

- 1st No. 663 Huntly, James, & Son, Hirsell Poultry Farm, Coldstream.
 2nd No. 666 Lang, E. H., Craig Bittern, Dalbeattie.
 3rd No. 665 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 667 Lang, E. H., Craig Bittern, Dalbeattie.
 H No. 661 Dalgleish, James P., West Grange, East Grange Station, Dunfermline.
 O No. 670 Young, John, Station House, Dirlerton.

CLASS 100. DUCKS—Indian Runner. Duck.

- 1st No. 674 Keay, James, Springbank, Blairgowrie.
 2nd No. 679 Young, John, Station House, Dirlerton.
 3rd No. 675 Keay, James, Springbank, Blairgowrie.
 V No. 673 Falconer, A. H., Ballaggan, Gollanfield.
 H No. 676 Lang, E. H., Craig Bittern, Dalbeattie.
 C No. 677 Lang, E. H., Craig Bittern, Dalbeattie.

CLASS 101. DUCKS—Any other Variety. Drake.

- 1st No. 683 Huntly, James, & Son, Hirsal Poultry Farm, Coldstream (Rouen).
 2nd No. 680 Dalgleish, James P., West Grange, East Grange Station, Dunfermline (Rouen).
 3rd No. 684 Huntly, James & Son, Hirsal Poultry Farm, Coldstream (Rouen).
 V No. 685 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Rouen).
 H No. 682 Hay, J. D., of Glenearn, Bridge of Earn (Magpie).

CLASS 102. DUCKS—Any other Variety. Duck.

- 1st No. 687 Huntly, James, & Son, Hirsal Poultry Farm, Coldstream (Rouen).
 2nd No. 688 Huntly, James, & Son, Hirsal Poultry Farm, Coldstream (Rouen).
 3rd No. 689 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Rouen).
 V No. 686 Hay, J. D., of Glenearn, Bridge of Earn (Magpie).

CLASS 103. GEESE. Gander.

- 1st No. 692 Shewan, Alexander, South Percyhorner, Fraserburgh.
 2nd No. 690 Fox-Brockbank, A. H., The Croft, Kirksanton, Silecroft, Cumberland.

CLASS 104. GEESE. Goose.

- 1st No. 693 Fox-Brockbank, A. H., The Croft, Kirksanton, Silecroft, Cumberland.
 2nd No. 694 Hay, J. D., of Glenearn, Bridge of Earn.
 V No. 695 Shewan, Alexander, South Percyhorner, Fraserburgh.

CLASS 105. TURKEYS. Cock.

- 1st No. 708 Shewan, Alexander, South Percyhorner, Fraserburgh.
 2nd No. 700 Hay, J. D., of Glenearn, Bridge of Earn.
 3rd No. 703 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 V No. 698 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline.
 H No. 706 Russell, Robert Reid, Alburne Knowe, Markinch.
 C No. 701 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol.
 C No. 704 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.

CLASS 106. TURKEYS. Hen.

- 1st No. 715 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 2nd No. 713 Russell, Robert Reid, Alburne Knowe, Markinch.
 3rd No. 710 Elgin and Kincardine, The Earl of, C.M.G., Broomhall, Dunfermline.
 V No. 713 Hay, J. D., of Glenearn, Bridge of Earn.
 H No. 714 Maitland, Brig.-General J. D. Heriot, C.M.G., D.S.O., of Errol, Errol Park, Errol.
 C No. 717 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling.
 C No. 721 Shewan, Alexander, South Percyhorner, Fraserburgh.

TABLE POULTRY.

CLASS 107. TABLE FOWLS—Any Pure Breed. Pair of Cockerels.

- 1st No. 722 Baird, Mrs G., Colstoun, Haddington (Sussex).
 2nd No. 728 Mechie, John, Burnside, Auchtermuchty (Sussex Light).
 3rd No. 727 Mechie, John, Burnside, Auchtermuchty (Dorking).
 V No. 724 Falconer, A. H., Ballaggan, Gollanfield (Wyandotte White).
 H No. 731 Penny, James G., Sauchie Poultry Farm, Crieff (Sussex Light).
 C No. 729 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling (Wyandotte).
 C No. 730 Morgan, William, Balcurnie, Windygates (Wyandotte Gold).

CLASS 108. TABLE FOWLS—Any Pure Breed. Pair of Pullets.

- 1st No. 745 Rogers, James, Forneth, Blairgowrie (Dorking Dark).
 2nd No. 741 Miller, Ian C., Witches Craig Poultry Farm, Blairlogie, Stirling
 (Rhode Island Red).
 3rd No. 735 Baird, Mrs G., Colstoun, Haddington (Sussex).
 V No. 738 Guthrie, Alexander, Craigs Forge, Montrose (Dorking Silver Grey).
 C No. 740 Mechie, John, Burnside, Auchtermuchty (Dorking Silver Grey).
 C No. 743 Penny, James G., Sauchie Poultry Farm, Crieff (Sussex Light).

CLASS 109. TABLE FOWLS—Game-Cross. Pair of Cockerels.

- 1st No. 746 Black, William A. P., Croftfoot, Old Polmont (Indian Cross).
 2nd No. 747 Dalglish, James P., West Grange, East Grange Station, Dunfermline (Indian Game, Plymouth Rock).

CLASS 110. TABLE FOWLS—Game-Cross. Pair of Pullets.

- 1st No. 751 Malcolm, Maurice, Boromeadow, Stirling (Indian Game and Speckled Sussex).
 2nd No. 749 Black, William A. P., Croftfoot, Old Polmont (Indian Cross).
 V No. 750 Dalglish, James P., West Grange, East Grange Station, Dunfermline (Indian Game, Plymouth Rock).

CLASS 111. TABLE FOWLS—Any other Cross. Pair of Cockerels.

- 1st No. 754 Morgan, William, Balcurvie, Windygates (Wyandotte Sussex).
 2nd No. 753 Falconer, A. H., Ballaggan, Gollanfield (Cochin Red).
 V No. 752 Black, William A. P., Croftfoot, Old Polmont (Sussex, Plymouth Rock).

CLASS 112. TABLE FOWLS—Any other Cross. Pair of Pullets.

- 1st No. 755 Black, William A. P., Croftfoot, Old Polmont (Sussex, Plymouth Rock).
 2nd No. 756 Falconer, A. H., Ballaggan, Gollanfield (Cochin Red).
 V No. 757 Morgan, William, Balcurvie, Windygates (Wyandotte Sussex).

CLASS 113. DUCKLINGS for Table Purposes—Any Breed or Cross.
Pair of Ducklings.

- 1st No. 758 Black, William A. P., Croftfoot, Old Polmont (Aylesbury).
 2nd No. 759 Huntly, Jas., & Son, Hirsell Poultry Farm, Coldstream (Aylesbury).
 V No. 760 Huntly, Jas., & Son, Hirsell Poultry Farm, Coldstream (Aylesbury).

DAIRY PRODUCE

CLASS 1. POWDERED BUTTER, not less than 3 lb.—Premiums, £4, £2, and £1.

- 1st No. 8 Monteith, Mrs, Island Farm, Bothkennar, Falkirk.
- 2nd No. 2 Fleming, Andrew, Threepland, Eaglesham.
- 3rd No. 13 Shanks, Miss, Broomhill, Denny.
- V No. 10 Rennie, Miss, Parkhead, Slamannan.
- H No. 4 Huntington, Mrs, Bonawe House, Tynullit.
- C No. 14 Thomas, James, Bowhouse, Balbeggie, Perth.

CLASS 2. FRESH BUTTER, Three 1-lb. Rolls.—Premiums, £4, £2, and £1.

- 1st No. 23 Monteith, Mrs, Island Farm, Bothkennar, Falkirk.
- 2nd No. 26 Rennie, Miss, Parkhead, Slamannan.
- 3rd No. 18 Fleming, Andrew, Threepland, Eaglesham.
- V No. 20 Shanks, Miss, Broomhill, Denny.
- H No. 22 M'Intosh, Mrs, Grandtully Castle Dairy, Aberfeldy.
- C No. 30 Stratton, Miss Isa A., Meadowmore, Methven.

CLASS 3. CHEDDAR CHEESE, 56 lb. and upwards.—
Premiums, £6, £4, £2, and £1.

- 1st No. 34 Cruickshanks, William, Kirkeoch, Kirkcudbright.
- 2nd No. 43 Ramsay, J. & W., Airdrie, Kirkbean, Dumfries.
- 3rd No. 37 M'Adam, James, Craigley, Castle Douglas.
- 4th No. 36 Hunter, S. & J., Castle Sinneness, Glenluce.
- V No. 32 M'Connell, W., Shankston Farm, Patna.
- H No. 35 Dean, William, Cairniehill, Borgue, Kirkcudbright.
- C No. 39 M'Intyre, Ian, Kirkminnoch, Ervie, Stranraer.

CLASS 4. SWEET-MILK CHEESE, flat shape, white in colour, from a dairy where all cheese is made according to the Dunlop method.—
Premiums, £4, £2, and £1.

- 1st No. 48 M'Colm, John, Cairngarroch, Drummorie, Stranraer.
- 2nd No. 46 Dowie, John, Myremill Dairy, Maybole.

CLASS 5. CHEESE, 14 lb. and under.—Premiums, £3, £2, and £1.

- 1st No. 51 Cruickshanks, William, Kirkeoch, Kirkcudbright.
- 2nd No. 53 Dowie, John, Myremill Dairy, Maybole.
- 3rd No. 52 Dean, William, Cairniehill, Borgue, Kirkcudbright.
- V No. 54 M'Adam, James, Craigley, Castle Douglas.
- H No. 50 Wallace, James, jun., Knockneen, Ervie, Stranraer.
- C No. 55 M'Connell, W., Shankston Farm, Patna.

BEE APPLIANCES AND HONEY, &c.

Should there be in any class three or less than three entries, the value of the first prize will be reduced to that of the second, the second to that of the third, and no third prize will be awarded.

OPEN CLASSES.

APPLIANCES.

CLASS 1. Collection of **HIVES** and **APPLIANCES**, to include amongst other articles the following: Three Standard Frame Hives complete, fitted with arrangements for supering. A suitable outfit for a beginner in Bee-keeping. Premiums, 80s, 40s, 20s.

1st No. 2 Steele, R., & Brodie, Wormit Works, Wormit.

CLASS 2. Best and most complete **STANDARD FRAME HIVE** for general use, unpainted.—Premiums, 20s, 15s, 10s.

1st No. 4 Steele, R., & Brodie, Wormit Works, Wormit.

2nd No. 5 Taylor, E. H., Limited, Welwyn, Hertfordshire.

CLASS 3. Best and most complete **STANDARD FRAME HIVE** for Cottager's use, unpainted, price not to exceed 35s.—Premiums, 20s, 15s, 10s.

1st No. 7 Steele, R., & Brodie, Wormit Works, Wormit.

2nd No. 8 Taylor, E. H., Limited, Welwyn, Hertfordshire.

CLASS 4. Any **NEW APPLIANCE** connected with Bee-keeping to which no prize has been awarded at any previous Highland Show.—Premiums, 10s, 5s.

1st No. 9 Langlands, James H., 31 Murraygate, Dundee.

2nd No. 13 Thomas, G., Melapis Apiaries, Exning, Newmarket.

H No. 10 Langlands, James H., 31 Murraygate, Dundee.

HONEY, &c.

A Silver Medal—awarded by the Scottish Bee-Keepers' Association to the winner of the greatest number of points in Honey Classes, calculated on the following basis: 1st prize, 3 points; 2nd prize, 2 points; 3rd prize, 1 point.

Gordon, T., & Sons, Torbrex Nurseries, Stirling (19 points).

CLASS 5. Six Sections of **COMB HONEY**.—Premiums, 20s, 15s, 10s.

1st No. 25 Pullar, David, The Gardens, Dura House, Cupar.

2nd No. 22 Leckie, R. W., Cramond U.F. Manse, Davidson's Mains, Edinburgh.

3rd No. 24 M'Naughton, Joseph, 44 Dumbarton Road, Stirling.

V No. 23 Macdonald, D. G., Kinloch House Gardens, Colleslie.

H No. 19 Fernie, William, Westfield Avenue, Cupar.

Q No. 27 Thake, J. M'D., Fife Bee Garden, Dura Den, Cupar.

CLASS 6. Six Jars of **RUN** or **EXTRACTED LIGHT-COLOURED HONEY**, approximate weight 6 lb.—Premiums, 20s, 15s, 10s.

1st No. 39 Thomas, G., Melapis Apiaries, Exning, Newmarket.

2nd No. 28 Birkett, John, Rainhill, Lancashire.

3rd No. 40 Young, John, Rose Cottage, Guildtown, Perth.

- V No. 30 Cochran, James, 18 Dundonald Road, Kilmarnock.
 H No. 29 Brown, Thomas C., Helenslea, St. Ninians, Stirling.
 C No. 33 Cordon, T., & Sons, Torbrex Nurseries, Stirling.

CLASS 7. Six Jars of RUN or EXTRACTED MEDIUM or DARK-COLOURED HONEY, excluding Heather, approximate weight 6 lb.—Premiums, 20s, 15s, 10s.

- 1st No. 45 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 42 Cochran, James, 18 Dundonald Road, Kilmarnock.
 3rd No. 46 Thomas, G., Melapis Apiaries, Exning, Newmarket.
 V No. 43 Duncan, Miss A. Lorna, Newlands, Dumfries.
 H No. 41 Brown, Thomas C., Helenslea, St. Ninians, Stirling.
 C No. 44 Fernie, William, Westfield Avenue, Cupar.

CLASS 8. Six Jars of PRESSED HEATHER HONEY in liquid form, approximate weight 6 lb.—Premiums, 20s, 15s, 10s.

- 1st No. 51 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 50 Duncan, Miss A. Lorna, Newlands, Dumfries.
 3rd No. 52 Pate, Thomas, Hopefield, Milnathort.
 V No. 55 White, Alexander, Sunnyhill, Old Cumnock.
 H No. 43 Brown, Thomas C., Helenslea, St. Ninians, Stirling.
 C No. 54 Thornton, Alexander, Station House, Carron, Morayshire.

CLASS 9. Six Jars of GRANULATED HONEY, approximate weight 6 lb.—Premiums, 20s, 15s, 10s.

- 1st No. 65 Pate, Thomas, Hopefield, Milnathort.
 2nd No. 64 Martin, Alexander, 5 Tulloch Cottages, Perth.
 3rd No. 69 Young, John, Rose Cottage, Guildtown, Perth.
 V No. 59 Duncan, Miss A. Lorna, Newlands, Dumfries.
 H No. 66 Pullar, David, The Gardens, Dura House, Cupar.
 C No. 63 Thornton, Alexander, Station House, Carron, Morayshire.

CLASS 10. Two Shallow Frames of COMB HONEY for extracting purposes.—Premiums, 20s, 15s, 10s.

- 1st No. 72 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 77 Thake, L. M'D., Fife Bee Garden, Dura Den, Cupar.

CLASS 11. PRODUCTS made with the aid of Honey. Recipe to be attached.—Premiums, 20s, 15s, 10s.

- 1st No. 81 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 82 Thake, L. M'D., Fife Bee Garden, Dura Den, Cupar.
 3rd No. 83 Thornton, Mrs J. E., Station House, Carron, Morayshire.
 V No. 80 Crombie, Henry, Spoutwells House, Dunkeld.
 H No. 79 Brown, Thomas C., Helenslea, St. Ninians, Stirling.

CLASS 12. Best display of HONEY in any form staged in space 3 feet by 3 feet, height from table not exceeding 4 feet. Weight of Honey not to exceed 100 lb.—Premiums, 60s, 30s, 20s.

- 1st No. 85 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 84 Brown, Thomas C., Helenslea, St. Ninians, Stirling.
 3rd No. 87 Thake, L. M'D., Fife Bee Garden, Dura Den, Cupar.

CLASS 13. Best exhibit of not less than 1 lb. of WAX in any form. Premiums, 20s, 15s, 10s.

- 1st No. 94 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 96 Lindsay, James, Park View, Arnside, Westmorland.
 3rd No. 92 Cunningham, John, 51 George Street, Bonhill.

- V No. 90 Cochran, James, 18 Dundonald Road, Kilmarnock.
 H No. 99 Young, John, Rose Cottage, Guildtown, Perth.
 C No. 83 Bailey, Stephen, Oak View, Two Mile Ash, West Horsham, Sussex.

CLASS 14. Best exhibit of not less than 1 lb. of WAX made into shape for retail trade and over-counter trade.—Premiums, 20s, 15s, 10s.

- 1st No. 108 Pullar, David, The Gardens, Dura House, Cupar.
 2nd No. 119 Young, John, Rose Cottage, Guildtown, Perth.
 3rd No. 105 Fernie, William, Westfield Avenue, Cupar.
 V No. 107 Lindsay, James, Park View, Arnside, Westmorland.
 H No. 100 Bailey, Stephen, Oak View, Two Mile Ash, West Horsham, Sussex.
 C No. 109 Thomas, G., Melapis Apiaries, Exning, Newmarket.

CLASS 15. OBSERVATORY HIVE with Queen and Bees.—
 Premiums, 50s, 30s, 15s.

- 1st No. 111 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 112 Pate, Thomas, Hopefield, Milnathort.
 3rd No. 113 Thake, L. M'D., Fife Bee Garden, Dura Den, Cupar.

CONFINED TO SCOTTISH EXHIBITORS.

CLASS 16. One Shallow Frame of COMB HONEY for extracting purposes.—
 Premiums, 20s, 15s, 10s.

- 1st No. 124 Thoms, John, Rosslyn Cottage, Coupar-Angus.
 2nd No. 119 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 3rd No. 115 Brown, Thomas C., Helenslea, St. Ninians, Stirling.
 C No. 123 Thake, L. M'D., Fife Bee Garden, Dura Den, Cupar.

CLASS 17. Six Sections of COMB HONEY.—
 Premiums, 30s, 20s, 10s.

- 1st No. 138 M'Naughton, Joseph, 44 Dumbarton Road, Stirling.
 2nd No. 131 Fernie, William, Westfield Avenue, Cupar.
 3rd No. 141 Pullar, David, The Gardens, Dura House, Cupar.
 V No. 146 Young, John, Rose Cottage, Guildtown, Perth.
 H No. 139 Martin, Alexander, 5 Tulloch Cottages, Perth.
 C No. 133 Hutton, Miss A. M., Gibliston, Kilconquhar.

CLASS 18. Six Jars of RUN or EXTRACTED MEDIUM or DARK-COLOURED HONEY (excluding Heather Honey), approximate weight 6 lb.—
 Premiums, 30s, 20s, 10s.

- 1st No. 148 Cochran, James, 18 Dundonald Road, Kilmarnock.
 2nd No. 152 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 3rd No. 150 Duncan, Miss A. Lorna, Newlands, Dumfries.
 V No. 153 Thoms, John, Rosslyn Cottage, Coupar-Angus.
 H No. 149 Crichton, John, 2 Castle Terrace, Craigie, Perth.
 C No. 155 Pullar, David, The Gardens, Dura House, Cupar.

CLASS 19. Six Jars of RUN or EXTRACTED LIGHT-COLOURED HONEY, approximate weight 6 lb.—
 Premiums, 30s, 20s, 10s.

- 1st No. 165 Gordon, T., & Sons, Torbrex Nurseries, Stirling.
 2nd No. 159 Brown, Thomas C., Helenslea, St. Ninians, Stirling.
 3rd No. 160 Alexander, John, Broadiach, Countesswells, Aberdeenshire.
 V No. 158 Cochran, James, 18 Dundonald Road, Kilmarnock.
 H No. 163 Duncan, Miss A. Lorna, Newlands, Dumfries.
 C No. 175 Young, John, Rose Cottage, Guildtown, Perth.

WOOL

PURE BREED CLASSES.

CLASS 1. BLACKFACE WOOL—EWE. Three Fleeces.—
Premiums, £3, £2, and £1.

- 1st No. 4 Girvan, W. M., Glenfalloch, Ardlui, Loch Lomond.
- 2nd No. 5 Lees, William, Mid Lix, Killin.
- 3rd No. 8 Novar Estates, Limited, Novar, Evanton, Ross-shire.
- V No. 1 Barbour, William, Strathdee, Kirkcudbright.

CLASS 2. BLACKFACE WOOL—WEDDER. Three Fleeces.—
Premiums, £3, £2, and £1.

- 1st No. 12 Barbour, William, Strathdee, Kirkcudbright.
- 2nd No. 13 Lees, William, Mid Lix, Killin.
- 3rd No. 14 Mackenzie, J. H. Munro, of Calgary, Isle of Mull.

CLASS 3. BLACKFACE WOOL—HOGG. Three Fleeces.—
Premiums, £3, £2, and £1.

- 1st No. 16 Barbour, William, Strathdee, Kirkcudbright.
- 2nd No. 18 Lees, William, Mid Lix, Killin.
- 3rd No. 19 Mackenzie, J. H. Munro, of Calgary, Isle of Mull.
- V No. 23 Young, Arthur, Garroch House, Dalry, Galloway.

CLASS 4. CHEVIOT WOOL—EWE. Three Fleeces.—
Premiums, £3, £2, and £1.

- 1st No. 27 Oliver, Thomas, Greenbanks, Robertson, Hawick.
- 2nd No. 23 Oliver, Thomas, Greenbanks, Robertson, Hawick.
- 3rd No. 24 Elliot, Thomas R., Attonburn, Yetholm, Kelso.
- V No. 26 Henderson, James, Wiltonburn, Hawick.

CLASS 5. CHEVIOT WOOL—HOGG. Three Fleeces.—
Premiums, £3, £2, and £1.

- 1st No. 31 Elliot, Thomas R., Attonburn, Yetholm, Kelso.
- 2nd No. 32 Henderson, James, Wiltonburn, Hawick.
- 3rd No. 34 Oliver, Thomas, Greenbanks, Robertson, Hawick.
- V No. 33 Oliver, Thomas, Greenbanks, Robertson, Hawick.

CLASS 6. BORDER-LEICESTER WOOL—EWE. Three Fleeces.—
Premiums, £3, £2, and £1.

- 1st No. 38 Murray, R. G., & Son, Spittal, Biggar.
- 2nd No. 40 Templeton, T. & M., Sandyknowe, Kelso.
- 3rd No. 39 Templeton, T. & M., Sandyknowe, Kelso.

CLASS 7. BORDER LEICESTER WOOL—HOGG. Three Fleeces.—
Premiums, £3, £2, and £1.

- 1st No. 44 Templeton, T. & M., Sandyknowe, Kelso.
- 2nd No. 43 Templeton, T. & M., Sandyknowe, Kelso.
- 3rd No. 42 Murray, R. G., & Son, Spittal, Biggar.

CLASS 8. HALF-BRED WOOL—EWE. Three Fleeces.—

Premiums, £3, £2, and £1.

- 1st No. 45 Brown, John C., Hundalee, Jedburgh.
- 2nd No. 48 Oliver, Thomas, Greenbanks, Robertson, Hawick.
- 3rd No. 49 Templeton, T. & M., Sandyknowe, Kelso.

CLASS 9. HALF-BRED WOOL—HOGG. Three Fleeces.—

Premiums, £3, £2, and £1.

- 1st No. 50 Brown, John C., Hundalee, Jedburgh.
- 2nd No. 52 Oliver, Thomas, Greenbanks, Robertson, Hawick.
- 3rd No. 54 Templeton, T. & M., Sandyknowe, Kelso.

CLASS 10. SHETLAND WOOL—EWE. Three Fleeces.—

Premiums, £3, £2, and £1.

- 1st No. 56 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
- 2nd No. 55 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
- 3rd No. 58 Cowan, Alexander, of Loganhouse, Penicuik.

CLASS 11. SHETLAND WOOL—HOGG. Three Fleeces.—

Premiums, £3, £2, and £1.

- 1st No. 62 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
- 2nd No. 61 Campbell, Mrs M. E., Dolphinton House, Dolphinton.
- 3rd No. 64 Cowan, Alexander, of Logan House, Penicuik.

RURAL INDUSTRIES SECTION

OPEN CLASSES.

SHETLAND KNITTING.

CLASS 1. FINE LACE GOODS.—Premiums, £3, £2, and £1.

- 1st No. 7 Johnston, Mrs Patrick, Seaview, Baltasound (Shawl).
 2nd No. 4 Jamieson, Miss M., Gerriegarh, Baltasound (Shawl).
 3rd No. 11 Manson, Mrs Magnus, Longfield, Dunrossness (Jumper).
 V No. 18 Sutherland, Mrs Thomas, 10 Chromate Lane, Lerwick (Shawl).
 H No. 16 Sutherland, Mrs David, 27 Burns Lane, Lerwick (Scarf).
 C No. 14 Spence, Miss Elizabeth, Braeside, Baltasound (Scarf).
 C No. 15 Spence, Miss Mimie, Colvadale, Uyeasound, Lerwick (Scarf).

CLASS 2. JUMPER, SPORTS COAT, or DRESS—one or more colours.—Premiums, £3, £2, and £1.

- 1st No. 57 Sutherland, Mrs Thomas, 10 Chromate Lane, Lerwick (Jumper).
 2nd No. 26 Duncan, Mrs Agnes, Caverton Mains, Kelso (Jumper—Grey and Colours).
 3rd No. 24 Cumming, Margaret J., Bridge of Gaur, Rannoch Station, Perthshire (Dress—Grey Ground and partly Fair Isle).
 V No. 22 Colvin, Miss Ina C. J., Ponston, Levenwick (Jumper—Fawn, Fair Isle Border).
 H No. 38 Jamieson, Miss M., Gerriegarh, Baltasound (Dress—Jumper and Skirt, Fawn).
 C No. 28 Gilbertson, W. B., Knowe, Virkie, Shetland (Jumper—White, Fair Isle Border).
 C No. 33 Jamieson, Christina, Maywick, Bigton, Shetland (Jumper—Moorit, Fair Isle Border).

CLASS 3. JUMPER or SPORTS COAT—all over Fair Isle.—Premiums, £3, £2, and £1.

- 1st No. 91 Mainland, Miss Catherine, Brake, Quendale, Dunrossness (Jumper).
 2nd No. 75 Goudie, Miss Jessie A., Scousburgh, Lerwick (Jumper).
 3rd No. 64 Arcus, Miss Barbara, Hillwell, Dunrossness (Jumper).
 V No. 103 Tulloch, Miss Katie, William Setter, Bigton, Shetland (Jumper).
 H No. 98 Sandison, Miss Martha, William Setter, Bigton, Shetland (Jumper).
 C No. 93 Manson, Mrs W. R., 1 St. Magnus Street, Lerwick (Sports Coat).
 C No. 102 Sutherland, Mrs W. T., Gerratown, Haroldswick (Jumper).

CLASS 4. OTHER EXHIBITS.—Premiums, £2, £1, and 10s.

- 1st No. 108 Christie, Miss Mary J., Fladabister, Cunningsburgh, Shetland (Stockings—Fawn).
 2nd No. 112 Hay, Jessie, Bridge of Gaur, Rannoch Station, Perthshire (Scarf).
 3rd No. 118 Pottinger, Mrs A. H., Brettabister, North Nesting, Lerwick (Gent's Knitted Vest).
 V No. 107 Brown, Miss M. J., Kingland, Ollaberry, Shetland (Shawl—White).
 H No. 105 Abernethy, Mrs M., Lochend, North Mavine, Shetland (Hap—White).
 C No. 110 Garriock, Mrs Mary, c/o Mrs Court, 5 Charlotte Place, Perth (Shawl—White).

TWEEDS.

CLASS 5. HARRIS or OTHER TWEED—Hand-spun, Hand-woven, and Vegetable-dyed.—Premiums, £3, £2, and £1.

- 1st No. 126 Ross, Mrs Donald, Tomich, Lairg.
 2nd No. 122 Morrison, Mrs Christina, The Village, Scalpay, Harris.
 3rd No. 124 Murray, Miss Margaret, Tressidy Hill, Lairg.
 V No. 125 Ross, Miss C., Craggiemore, Rogart.

CLASS 6. TWEED—Mill-spun, Hand-woven.—
Premiums, £3, £2, and £1.

- 1st No. 131 Murray, Miss Margaret, Tressidy Hill, Lairg.
2nd No. 129 Macdonald, Miss Margaret, Rheanbreck, Lairg.
3rd No. 134 Sutherland, Miss Johanna, Burnside, Rogart.

MISCELLANEOUS.

CLASS 7. HOME-MADE RUG (WOOL).—
Premiums, £3, £2, and £1.

- 1st No. 157 M'William, Mrs Jeannie, Garguston, Muir of Ord.
2nd No. 140 Davidson, Mrs Christina A., Bank House, Rothienorman, Aberdeenshire.
3rd No. 137 Bisset, Mrs Kate, Borlum, Fort Augustus.
V No. 152 M'Feat, Miss Annie, Kingswells, Auchterarder.
H No. 160 Morgan, Mrs A., Annfield, Kingskettle.
C No. 135 Aitchison, Miss Charlotte, Richmond House, Fort-Augustus.
C No. 139 Cowie, Mrs Jessie Roy, Dalnahaine, Fort-William.
C No. 151 MacDougall, Mrs G., 42 High Street, Elie.
C No. 155 M'Laren, Mrs M. S., Manse of Errol, Errol, Perthshire.
C No. 159 Moodie, Miss M., Brook House, Pitlochry.
C No. 162 Rankin, Mrs M., Mamore Cottage, Fort-William.
C No. 166 Waddell, Miss J. A., Yew Cottage, Kirriemuir.

CLASS 8. EMBROIDERY—White.—Premiums, £3, £2, and £1.

- 1st No. 171 Drennan, Miss Mary J., Carse Hall, Limavady, Co. Derry (Table Centre).
2nd No. 178 Keay, Mrs, Bangour, Dechmont, West Lothian (Tea Cloth).
3rd No. 170 Drennan, Kathleen W., Carse Hall, Limavady, Co. Derry (Collar).
V No. 179 M'Caa, Miss Janet, Garrallan, Old Cumnock (Tea Cloth).
H No. 174 Eden, Miss Annie, Monlettie, Methlick, Aberdeenshire (Duchess Set).
C No. 176 Hetherington, Miss S., Slaley, Riding Mill, Northumberland (Table Centre).

CLASS 9. EMBROIDERY—Coloured.—Premiums, £3, £2, and £1.

- 1st No. 199 Fraser, A. H. T., Elm Cottage, Culcabock, Inverness (Frame).
2nd No. 200 Fullarton, Margaret S. S., Burnside, Loans, Troon (Picture).
3rd No. 206 M'William, Mrs Jeannie, Garguston, Muir-of-Ord (Curtain).
V No. 204 Macmerry Women's Rural Institute, East Lothian (Bed Spread).
H No. 202 Hydes, E. Marie, 78 Norfolk Road, Sheffield (Photograph Frame).
C No. 188 Baxter, Miss Evelyn Vida, The Grove, Upper Largo (Portiere—Wool on Linen).

CLASS 10. LEATHER GLOVES.—Premiums, £2, £1, and 10s.

- 1st No. 219 Dunchurch and Thurlaston W.R.I., Rugby.
2nd No. 214 Dunchurch and Thurlaston W.R.I., Rugby.
3rd No. 225 Jack, Miss Ella M., Colinsburgh, Kilconquhar, Fife.
V No. 218 Dunchurch and Thurlaston W.R.I., Rugby.
H No. 216 Dunchurch and Thurlaston W.R.I., Rugby.
C No. 226 Jamieson, Mrs I. A., School House, Aberlady.
C No. 229 Munro, Mrs Alexander, Castle Street, Portmahomack.
C No. 231 Wait, Mrs B., Llanbleddian Gardens, Cardiff.

CLASS 11. SPECIMEN OF LEATHER WORK OTHER THAN GLOVES.—

Premiums, £2, £1, and 10s.

- 1st No. 237 Dunchurch and Thurlaston W.R.I., Rugby (Pouffe).
 2nd No. 233 Burns, Miss A. M., Fernleigh, Melrose (Bag).
 3rd No. 239 Jamieson, Mrs I. A., School House, Aberlady (Bag).
 V No. 240 Jamieson, Mrs I. A., School House, Aberlady (Bag).
 H No. 242 M'Laren, Irene M. H., Redcliffe, Barnhill, Perth (Wallet).
 C No. 236 Clark, Mrs Kate, Bovindine, Rye, Sussex (Cushion).
 C No. 241 Macfarlane, Mrs I., Manse of Dull, Aberfeldy (Flowers).

CLASS 12. SPECIMEN OF FURCRAFT.—Premiums, £2, £1, and 10s.

- 1st No. 247 Clark, Mrs Kate, Bovindine, Rye, Sussex (Fur Stole—White).
 2nd No. 252 Edgar, Mary J., Kelton Mains, Castle Douglas (Rabbit-skin Coat).
 3rd No. 245 Allison, Miss Mary D., Kinnsaird Castle, Brechin (Red Fox Set).
 V No. 250 Dunchurch and Thurlaston W.R.I., Rugby (Gloves).
 H No. 246 Buttar, Miss Betty S., Corston, Coupar-Angus (Fur Gloves).
 C No. 251 Edgar, Grace G., Kelton Mains, Castle Douglas (Moleskin Wrap).

CLASS 13. SPECIMEN OF HAND-PAINTED POTTERY.—

Premiums, £2, £1, and 10s.

- 1st No. 267 Macmerry Women's Rural Institute, East Lothian (Fruit Bowl).
 2nd No. 268 Mak' Merry Studio, Macmerry, East Lothian (Porridge Set).
 3rd No. 272 Mak' Merry Studio, Macmerry, East Lothian (Bowl).
 V No. 266 Macmerry Women's Rural Institute, East Lothian (Water Jug).
 H No. 269 Mak' Merry Studio, Macmerry, East Lothian (Tea Set).
 C No. 259 Amour, Richard, "Bough Studio," Dublin Street Mews, Edinburgh (Ornamental Dish).

CLASS 14. SPECIMEN OF BASKET-WORK (Raffa not eligible).—

Premiums, £2, £1, and 10s.

- 1st No. 281 M'Millan, John, Hillside Sanatorium, Perth (Tea Tray).
 2nd No. 280 M'Lean, Mrs Janet, Monachyle, Balquhidder, Strathrye (Basket).
 3rd No. 286 Wilson, John, Lomond View, Strathmiglo (Basket Bag).
 V No. 279 Kellock, Mrs Annie, Rathillet Mill, Cupar-Fife (Potato Basket).
 H No. 285 Wilson, John, Lomond View, Strathmiglo (Work Basket).
 C No. 282 M'Millan, John, Hillside Sanatorium, Perth (Tea Tray).

CLASS 15. BOTTLED FRUIT (three bottles, bottled in or before 1823).—

Premiums, £2, £1, and 10s.

- 1st No. 287 M'Feat, Miss Annie, Kingswells, Auchterarder (Tomatoes, Plums, Apples and Plums).
 2nd No. 288 Mackay, Mrs M., Mount Melville, St. Andrews (Various, Plums, Pears).
 3rd No. 289 Morgan, Mrs A., Annfield, Kingakettle (Plums, Raspberries, Currants).

CLASS 16. BEST COLLECTION OF VEGETABLE-DYED WOOLS.—

Premiums, £2, £1, and 10s.

- 1st No. 292 M'Kenzie, Mrs Kenneth, 41 Big Sand, Gairloch, Ross-shire.
 2nd No. 291 MacCorquodale, Miss M., Claddach, Kirkibost, Lochmaddy.
 3rd No. 294 Murray, Miss Margaret, Tressidy Hill, Laig.
 V No. 296 Sutherland, Miss E. C., 10 Chromate Lane, Lerwick.

CLASS 17. HOME-SPUN YARN—2·3 cuts.—
Premiums, £2, £1, and 10s.

- 1st No. 308 Spence, Mrs Jamima, Colvadale, Uyeasound, Lerwick.
2nd No. 309 Sutherland, Miss E. C., 10 Chromate Lane, Lerwick.
3rd No. 300 Macdonald, Harriet, Houghgarry, Tigharry, Lochmaddy.
V No. 298 Brown, Miss M. J., Kingland, Ollaberry, Shetland.

CONFINED CLASSES.

Open to Institutes and Members of Institutes in the whole of Scotland.

CLASS 18. EMBROIDERY—White.—Premiums, £3, £2, and £1.

- 1st No. 311 Baird, Mrs Elizabeth M., Netherwood, Dumfries (Bedspread—
Ayrshire Embroidery).
2nd No. 333 Mackenzie, Miss Mary, Whitelees, Symington, Kilmarnock
(Duchess Set).
3rd No. 330 M'Caa, Miss Janet, Garrallan, Old Cumnock (Tea Cloth).
V No. 336 Mack' Merry Studio, Macmerry, East Lothian (Table Cloth).
II No. 332 Mackay, Mrs I., Craigellie Cottage, Lonmay, Aberdeenshire (Tea
Cloth).
C No. 319 Culbert, Elizabeth, Charleston, Stanley, Perthshire (Tea Cloth).
C No. 320 Culbert, Margaret, Charleston, Stanley, Perthshire (Tea Cloth).
C No. 322 Eden, Miss Annie, Monlettie, Methlick, Aberdeenshire (Tea Cosy).

CLASS 19. KNITTED JUMPER OR JERSEY.—
Premiums, £3, £2, and £1.

- 1st No. 369 M'Caa, Miss Janet, Garrallan, Old Cumnock (Jumper).
2nd No. 351 Brown, Miss M. E., Cairnryan Women's Rural Institute, Stranraer
(Jersey—Navy, Woollen).
3rd No. 367 Kilgour, Mrs A. H., Tignabruach, Fort-William (Jumper).
V No. 373 Mackay, Mrs I., Craigellie Cottage, Lonmay, Aberdeenshire
(Jumper—Silk).
H No. 374 M'Kay, Maggie, Westgate, Breda, Alford, Aberdeenshire (Jumper—
Silk).
C No. 356 Forbes, Mrs H., Sunnysbank, Alford, Aberdeenshire (Jumper—Silk).
C No. 381 Shaw, Isabella, Gellyburn, Murthly (Jumper—Silk).
C No. 382 Thom, Mrs M. J., Craskins Cottage, Tarland (Jumper—Silk).

*Confined to Institutes and Members of Institutes in the Central Area of
Scottish Women's Rural Institutes.*

CLASS 20. RUG—made from old material.—
Premiums, £3, £2, and £1.

- 1st No. 387 Cameron, Miss Mary J., Coupsteps, Powmill, Dollar.
2nd No. 390 Jamieson, Miss J., Scotlandwell, Leslie, Fife.
3rd No. 388 Fordyce, Mrs, Wellfield Gardens, Gateside, Fife.
H No. 385 Aird, Mrs Euphemia, Drummond Place, Kinnesswood, Kinross.
C No. 394 Morgan, Mrs A., Annfield, Kingskettle.
C No. 395 Rodger, Mrs James, Kinloch Home Farm, Collessie, Fife.

CLASS 21. EMBROIDERY—Woollen.—Premiums, £2, £1, and 10s.

- 1st No. 403 Rintoul, Miss L. J., Lahill, Largo (Jacobean).
2nd No. 396 Baxter, Miss Evelyn Vida, The Grove, Upper Largo (Bedspread—
Linen).
3rd No. 402 Motion, Mrs A., West Dron, Dairsie, Fife (Table Mat).
V No. 401 M'Queen, Mrs James, Station House, Kirkbuddo, Forfar (Table
Runner).

CLASS 22. SOCKS—two pairs—one pair 5-ply fingering, one pair wheeling.—
Premiums, £2, £1, and 10s.

1st No. 413 Sime, Mrs H. B., Bellevue, Lower Largo.

2nd No. 411 Rintoul, Miss L. J., Lahill, Largo.

3rd No. 404 Baxter, J., Pow Farm, Dollar.

C No. 408 Leckie, Miss Agnes, Main Street, Buchlyvie, Stirlingshire.

CLASS 23. HOME-MADE QUILT.—Premiums, £3, £2, and £1.

1st No. 420 Sime, Miss M. F., Bellevue, Lower Largo.

2nd No. 417 Laurie, Mary P., Murray Place, Pitlochry.

3rd No. 416 Grosset, Miss Agnes, Foswell, Auchterarder.

V No. 422 Terras, S. Janie, Wester Craigfoodie, Dairsie, Fife.

H No. 419 Scrimgeour, Mrs Margaret, Netherton of Fonab, Pitlochry.

HORSE - SHOEING

Open to Shoeing-Smiths from any part of the United Kingdom.

Canteen of Cutlery, given by Messrs Neilson & Cleland, Coatbridge,
to the winner of First Prize in Class 1.

No. 41 Marshall, George Mungall, Gateside, Beith.

Gold Medal, given by the Mustad Nail Company, to the winner of
Second Prize in Class 1.

No. 46 Ritchie, John, 33 Skene Terrace, Aberdeen.

CLASS 1. FARM or WORK HORSES (Open Class).—Premiums, £5, £5, £5, £4,
£3, £2, £1.

1st No 41 Marshall, George, Mungall, Gateside, Beith.

2nd No 46 Ritchie, John, 33 Skene Terrace, Aberdeen.

3rd No. 22 Hall, James, Halfway House, Cardonald, Glasgow.

4th No. 6 Chalmers, Alexander, Junr., 388 Paisley Road, Glasgow, S.S.

5th No. 23 Hall, Robert, Muirhead Smithy, Chryston, Glasgow.

6th No. 32 Johnston, William, Blacksmills, Pitscottie, Cupar.

7th No. 16 Fenwick, Robert, A.F.C.L., 78 Ward Road, Dundee.

V No 28 Jackson, John C., Invereighy Smithy, Forfar.

H No. 7 Cleland, Alexander, Torphichen, Bathgate.

C No. 34 Leckie, James, The Knowe, North Muir, Kirriemuir.

Canteen of Cutlery, given by Messrs Neilson & Cleland, Coatbridge,
to the winner of First Prize in Class 2.

No. 1 Ballie, James, Eassie, Forfar.

Gold Medal, given by the Mustad Nail Company, to the winner of
Second Prize in Class 2.

No. 13 Steel, Andrew, Jackton, East Kilbride.

CLASS 2. FARM or WORK HORSES (Juniors under twenty-five years of age).—
Premiums, £4, £3, £3, £2, £1.

1st No. 1 Ballie, James, Eassie, Forfar.

2nd No. 13 Steel, Andrew, Jackton, East Kilbride.

3rd No. 11 Martin, E., Junr., Closeburn Village, Thornhill, Dumfriesshire.

4th No. 10 MacDonald, John, Culduthel Smithy, Inverness.

5th No. 9 MacDonald, Allan, East Gate Smithy, Inverness.

V No. 2 Bissett, George, Burnside, Cupar.

H No. 4 Currie, William, 11 Brown Street, Perth.

C No. 6 Farmer, William, Ballinbreich Terrace, Leslie.

NEW IMPLEMENTS.

The Judges, having inspected the new implements submitted for competi-
tion, have awarded the Society's Silver Medal to the following:—

Stewart, Alastair C., Arrivian, Tyndrum (No. 1967)—Safety Pneumatic Dipping
Tube.

Storie, William R., Agricultural Engineer, Kelso (No. 353)—"Storie" Disc-
Shoe Surface Sowing Attachment.

JUDGES.

Sherthern.—R. S. M'William, Garguston, Muir of Ord; J. M. Strickland, Bainesse, Catterick, Yorks.

Aberdeen-Angus.—Colonel Harry Forbes, Greystone, Alford. Aberdeen; Charles F. Tulloch, Braevall of Lethen, Nairn.

Galloway.—Walter Biggar, Grange Farm, Dalbeattie.

Highland.—Michael G. M'Diarmid, Finart, Rannoch Station.

Ayrshire.—James Wallace, Chapelhill, Dunrod, Castle-Douglas; A. Y. Allan, Aitkenbar, Dumbarton.

British Friesian.—Mrs A. Brown, Haydon Hill House, Aylesbury, Bucks; W. Cassels Jack, Robiesland, Lanark.

Red Poll.—J. P. Milne, Lee Lane Farm, Wendesham, Surrey.

Belted Galloway.—John Kincaid, Corseyard, Knockbren, Kirkcudbright.

Fat Cattle.—R. S. M'William, Garguston, Muir of Ord; Colonel Harry Forbes, Greystone, Alford, Aberdeen.

Draught Stallions, Entire Colts, and Geldings.—William Robertson, Park of Keir, Dunblane; Thomas Templeton, Sandyknowe, Kelso; Matthew Marshall, Bridgebank, Stranraer.

Draught Mares and Fillies.—Harry Milne, Fetterletter, Fyvie, Aberdeenshire; Robert Paton, Mains of Airies, Stranraer; George McDowall, Briarbrae, Stranraer.

Hunters.—Lieut.-Colonel John M'Kie, Glencaird, Newton-Stewart.

Hackneys, Ponies, and Harness Horses.—John Wefghitt, East Thorpe, Londesborough, York.

Highland Ponies.—Alex. Macdonald, Estates Office, Aberfeldy.

Western Island Ponies.—William Cairns, Glenfinlas, Caillander.

Shetland Ponies.—Robert Park, Brunstane, Portobello; David Dow, Rossie, Auchtermuchty.

Blackface Sheep.—William M. Clark, Blackhope, Heriot; James Mitchell, jun., Henderland, Selkirk; James Bennie, Smallburn, Fintry, Stirlingshire.

Cheviot.—Hope W. Hunter, Reddings, Moffat; Walter Mundell, Delny House, Delny, Ross-shire.

Border Leicester.—Samuel Davidson, Northseat, Auchedry, Tarves; James Jeffrey, Little Spott, Dunbar.

Hall-Bred and Fat Sheep.—Walter J. Grieve, Southfield, Hawick.

Oxford Down.—J. H. Toppin, Musgrave Hall, Skelton, Penrith.

Suffolk.—C. J. Rush, The Hall Farm, near Newmarket.

Shropshire.—John Crowe, Woodhouse, Aldford, Chester.

Dorset Horn.—John Crowe, Woodhouse, Aldford, Chester.

Goats.—T. C. Solomon, J.P., Struther, Dunlop.

Large White Pigs.—Alfred W. White, Hillegom, Spalding, Lincolnshire.

Middle White.—R. P. Haynes, Delves Green Farm, Wednesbury, Staffs.

Berkshire.—J. M. Strickland, Bainesse, Catterick, Yorks.

Large Black.—James Adam, Park, Nairn.

Gloucestershire Old Spots.—Peter Fergusson, Estate Office, Wrotham Park, Barnet, Herts.

Cumberland.—John J. Wilson, Hall Flatt Scaley, Carlisle.

Poultry (Ordinary Classes).—J. H. Gilbert, Millrow Cottage, Blockley, Worcestershire, Classes 1 to 16, 59 to 70, 91 to 106; David Reid, Firthview, Portgordon, Classes 17 to 58. (Game)—George Faulkner, Rowton, Chester, Classes 71 to 90, 107 to 113.

Dairy Produce.—William M. Lennox, c/o A. M'Lelland & Son, Portland St., Kilmarnock.

Bees Appliances and Honey.—G. H. Pritchard, Firth View, Beaulieu.

Wool.—James Noble, Wool Merchant, 22 Bridge Street, Galashiels.

Rural Industries.—Miss Bruce, 111 George Street, Edinburgh, Classes 1, 5, 6, 7, 16, and 17; Miss Moir, 15 George Street, Perth, and Mrs Robert Hunter, St John's, Glasgow Road, Perth, Classes 2, 3, 4, 19, 20, 22, and 23; Miss Pearce, Edinburgh Ladies' College, Queen Street, Edinburgh, Classes 8, 9, 13, 18, and 21; Mrs Geoffrey Gordon, 2 Eton Terrace, Edinburgh, Classes 10, 11, and 12; Miss Howard, 8 Kinnoull Street, Perth, Class 14; John Mitchell, Union Buildings, Aberdeen, Class 15.

Horse-Shoeing.—J. Brown, M.R.C.V.S., 55 York Place, Perth; G. G. M'Diarmid, 17 Cross Arthurie Street, Barrhead; James Scott, 25 Oldmeldrum Road, Bucksburn, Aberdeen.

ATTENDING MEMBERS.

SHORTHORN.—Alexander Robertson, G. B. Shields, David Hardie, David Maxwell, James A. Rollo.

ABERDEEN-ANGUS and FAT CATTLE.—William S. Niven, George Will, Robert M. Reid, Jas. Thomas.

GALLOWAY.—James M'Queen, David Fenton.

HIGHLAND.—Hon. A. D. Murray, William Bruges, William Stirton.

AYRSHIRE.—Andrew B. Leitch, John M. Roger, Thomas Hollingworth, John Motion

BRITISH FRIESIAN.—Thomas Elder, James Gray, Lord Dean of Great George Henderson, J.P., John M. Matthew.

RED POLL.—Falconer L. Wallace, Thomas Muirhead, John F. Smith.

BELTED GALLOWAY.—Sir David Wilson, Bart., David Pattullo.

DRAUGHT STALLIONS.—James Durno, William Baxter, Thomas J. Gardiner, Robert Meiklem, James Whyte.

DRAUGHT MARES.—Robert Jeffrey, William Meiklem, William Clark, George W. Finlayson, James W. Wyllie.

HUNTERS.—Colonel F. J. Carruthers, Robert Inglis, James Paton.

HACKNEYS, PONIES, and HARNESS HORSES.—The Earl of Elgin and Kincardine, C.M.G., P. L. Ballingall, Brig-General G. R. H. Chespe.

HIGHLAND PONIES.—Hugh Martin, Charles Hay, A. W. Howison.

WESTERN ISLAND PONIES.—Sir Hugh Shaw Stewart, Bart., C.B., George Dow, William Mungall.

SHETLAND PONIES.—Lieut.-Colonel W. T. R. Houldsworth, F. W. Christie, J. Martin Smith.

BLACKFACE SHEEP.—Thomas Elliot, James Grieve, James Clark, James D. Hay.

CHEVIOT.—Alex. Niven, David Blair, Alex. Shanks.

BORDER LEICESTER.—Thomas Kirk, James Rodger, Alex. Graham, George Pople.

HALF-BRED and FAT SHEEP.—Norman J. Nasmyth, James Butters, John B. Tulloch.

OXFORD DOWN.—William Tod, Alex. Clark.

SUFFOLK.—Captain John MacGillivray, W. W. Bell, William Lindsay.

SHROPSHIRE and DORSET HORN.—A. A. Hagart Speirs, James H. S. Macdonald, C.D.A.

GOATS.—Major J. Kemp Smith, Bailie Jas Stewart, William Young.

LARGE WHITE PIGS.—Archibald Whyte, John J. Calder, Joseph Murray.

MIDDLE WHITE.—General Sir Walter Charles Ross, K.B.E., C.B., William C. Hunter, W.S., William L. Thoms.

BERKSHIRE.—Peter D. Burns.

LARGE BLACK.—William Low, John M. Fairlie, George Tasker.

GLOUCESTERSHIRE OLD SPOTS and CUMBERLAND.—Major R. W. Sharpe, Bailie Thomas Hunter, J.P., Adam W. Waldie.

POULTRY.—Dr J. F. Techer, Councillor J. Downie, David Grant, Treasurer James M'Cracken, Bailie Robert M. Ross, Bailie J. Taylor, J.P.

DAIRY PRODUCE.—John Stewart, Henry Watson, William Wyllie.

BEE APPLIANCES and HONEY.—Dr R. Stewart MacDougall, A. Aikman Blair, James Simpson, Alexander Storrar.

WOOL.—David Black.

RURAL INDUSTRIES.—Robert Adam, James M'L. Marshall, Charles J. D. Munro.

HORSE-SHOING.—Robert Jeffrey, William Meiklem, William Tod, John Campbell, Alex. M. Johnston, William M'Donald.

II.—VETERINARY DEPARTMENT.

CLASS EXAMINATIONS, 1924.

Silver Medals were awarded to the following :—

GLASGOW VETERINARY COLLEGE.

Junior Anatomy	Thomas Johnston, Bridgeton.
Chemistry	Thomas Johnston, Bridgeton.
Biology	Thomas Johnston, Bridgeton.
Senior Anatomy	Roy S. Marshall, Motherwell.
Physiology	Roy S. Marshall, Motherwell.
Zootechny	J. Yule Bogue, Chalford.
Materia Medica	William Weipers, Glasgow.
Pathology	William Weipers, Glasgow.
Hygiene	David N. Walker, Salsburgh.
Surgery	Thomas M'William, Hamilton.
Medicine	John M'Quaker, Glenluce.

11 Large Silver Medals, £11, 11s.

ROYAL (DICK) VETERINARY COLLEGE.

Junior Anatomy	J. W. H. Holmes, Derby.
Chemistry	J. W. H. Holmes, Derby.
Biology	J. W. H. Holmes, Derby.
Senior Anatomy	G. B. Brook, Kinlochleven.
Physiology	J. S. Adamson, Wemyss Castle.
Zootechny	H. Burrow, Lancaster.
Materia Medica	D. Cameron, Comrie.
Pathology	A. J. Weighton, Hull.
Hygiene	W. Scott, Edinburgh.
Surgery	J. Hill, Ballyarnott.
Medicine	E. R. Corrigan, Stromness.

11 Large Silver Medals, £11, 11s.

III.—DISTRICT COMPETITIONS, 1924.

16 Districts—16 Grants of £12 each (Section I.)	£192 0 0
9 " Grants of £15 each	135 0 0
12 " Special Grants	111 11 0
Medals for Shows (68 large)	71 8 0
3 " Medals for Cottages, Gardens, &c. (4 Minor)	1 12 0
30 " Medals for Hoeing Competitions, 1923-24	12 0 0
189 " Medals for Ploughing, 1923-24	80 10 0
100 Long Service Certificates, £44, 8s. 9d., and Medals, £53, 19s. (1923-24)	98 7 9
	<hr/>
	£702 8 9

ABSTRACT OF PREMIUMS.

District Competitions	£604 1 0
Long Service Awards	98 7 9
Veterinary Colleges (22 Medals)	23 2 0
	<hr/>
	£725 10 9

INVERNESS SHOW, 1923.

ALTERATIONS IN PRIZE LIST.

On account of animals failing to comply with the Regulations as to calving, the following changes have taken place in the list of animals for which prizes were awarded:—

CATTLE

SHORTHORN.

CLASS 7. HEIFER or COW, calved on or after 1st December 1920.—
Premiums, £10, £5, £3, and £2.

- 1st No. 67 General The Lord Lovat, K.T., Beaufort Castle, Beaully, Heifer, "Beaufort Ellen Terry" (26,819).
 * No. 65 George Harrison, Gainford Hall, Darlington, Heifer, "Gainford Missie 2nd" (24,884).
 2nd No. 69 R. S. M'William, Gargustou, Muir of Ord, Ross-shire, Heifer, "Golden Marchioness" (27,276).
 3rd No. 66 John Heaton, Low Startforth Hall, Barnard Castle, Heifer, "Thorn Fragrance Queen."
 4th No. 68 William M'Allister, Drakies, Inverness, Cow, "Inverness Queen Pearl" (26,901).

ABERDEEN-ANGUS.

CLASS 17. HEIFER, calved on or after 1st December 1920.—
Premiums, £10, £5, £3, and £2.

- 1st No. 155 Sir John R. Findlay, K.B.E., of Aberlour, Aberlour, "Gens" (69,375)
 * No. 154 Robert Brims, Pitcalzean Mains, Nigg, Ross-shire, "Witchcraft of Pitcalzean" (68,889).
 2nd No. 157 J. Hamilton Houldsworth of Dallas, Morayshire, "Daisy of Dallas" (69,727).

HIGHLAND.

CLASS 30. HEIFER, calved in 1920.—Premiums, £10, £5, £3, and £2.

- 1st No. 240 The Earl of Southesk, Kinnaird Castle, Brechin, "Princess Ruth VI."
 * No. 242 D. A. Stewart, Lochdhu, Nairn, "Laoghag XXX."
 2nd No. 241 The Earl of Southesk, Kinnaird Castle, Brechin, "Sidonia V."
 3rd No. 238 W. Dalziel Mackenzie of Farr, House of Farr, Inverness, "Bean-an-Tigh of Farr."
 4th No. 236 Board of Agriculture for Scotland, Beechwood, Inverness, "Proiseag Sgiathach of Faillie."

The animals failing to qualify are marked thus ().*

AYRSHIRE.

CLASS 36. HEIFER, calved in 1921.—Premiums, £10, £5, and £3.

- 1st No. 281 John Logan, Bargenoch, Drongan, Ayrshire, "Bargenoch Dawn" (76,150).
 2nd No. 276 Thomas Barr, Hobsland, Monkton, "Hobsland Janet" (77,915).
 * No. 278 James Howie, Hillhouse, Kilmarnock, "Howie's Starry Gem III." (83,640).
 3rd No. 277 Thomas Barr, Hobsland, Monkton, "Hobsland Lucky Girl" (77,924).

BELTED GALLOWAY.

CLASS 55. HEIFER, calved on or after 1st December 1920.—
 Premiums, £8, £4, and £2.

- 1st No. 436 Robert Graham, Auchengassel, Twynholm, "Mark Polly" (219 B).
 2nd No. 434 The Marquis of Bute, Craigeach, Kirkcowan, Wigtownshire, "Mochrum Minnie" (236 B).
 * No. 437 General Sir Ian Hamilton, Lullenden Farm, East Grinstead, Sussex, "Knockbrex Miss Mannering" (182 B).
 * No. 435 Sir William Cross, Bart., of Scatwell, Strathpeffer, "Scatwell Lily of Almorness XX." (249 B).
 * No. 433 The Marquis of Bute, Craigeach, Kirkcowan, Wigtownshire, "Mochrum Dairylass" (229 B).
 3rd No. 432 Mrs Brown of Knockbrex, Kirkeudbright, "Knockbrex Butterfly."

The animals failing to qualify are marked thus ().*

STATE OF THE FUNDS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

As at 30th NOVEMBER 1924

I. BRITISH GOVERNMENT STOCKS—			
£19,300 5 per cent War Stock, 1929-47, at 101½	.	£19,565	7 6
£4,000 4½ per cent Conversion Loan, at 97½ x.d.	.	3,887	10 0
£1,679, 13s. 4d. 2½ per cent Consolidated Stock, at 58½	.	978	8 1
		<u>£24,431</u>	5 7
II. HERITABLE BONDS—			
£18,000 at 4½ per cent . . . . .	.	18,000	0 0
III. RAILWAY DEBENTURE AND PREFERENCE STOCKS—			
£17,050 London and North-Eastern Railway Co. 3 per cent Debenture Stock, at 63½	.	£10,867	7 6
£11,554 Do. do. 4 per cent do., at 84½	.	9,763	2 7
£16,105 London Midland and Scottish Railway Co. 4 per cent Debenture Stock, at 85	.	13,689	5 0
£1,500 Do. do. 4 per cent Preference Stock, at 81½	.	1,222	10 0
£703 Southern Railway Co. 4 per cent Debenture Stock, at 84½	.	594	0 8
£450 Do. do. 5 per cent Preference Stock, at 101	.	454	10 0
£112 Do. do. 5 per cent Guaranteed Preference Stock, at 108	.	115	7 2
		<u>36,706</u>	2 11
IV. BANK STOCKS—			
£5,000 0 0 Royal Bank of Scotland, at 287	£14,350	0 0	
£2,218 16 6 Bank of England, at 258	5,724	10 9	
£1,009 13 4 Bank of Scotland, at 332	3,352	1 7	
£2,850 0 0 "B" Shares, Barclay's Bank, at £2, 16s.	7,980	0 0	
	<u>31,406</u>	12 4	
V. COLONIAL GOVERNMENT STOCKS—			
£2,500 Dominion of Canada Registered 3½ per cent Stock (1930-50), at 82½	£2,071	17 6	
£2,500 New South Wales Inscribed 5 per cent Stock (1935-55), at 100½	2,521	17 6	
£2,500 Natal Inscribed 3½ per cent Stock (1914-39), at 85½	2,128	2 0	
£2,000 Western Australia Inscribed 4 per cent Stock (1942-62), at 88	1,760	0 0	
£1,120 Victorian Government Inscribed 3½ per cent Stock (1929-49), at 79½	893	4 0	
	<u>9,375</u>	1 0	
VI. ANNUITY STOCK—			
£32 Edinburgh and Leith Corporation Gas Commissioners, at 20½	656	0 0	
Carry forward	£120,575	1 10	

	Brought forward	£120,575	1	10		
VII. ESTIMATED VALUE of Buildings, No. 3 George						
IV. Bridge	£3,100	0	0			
VIII. ESTIMATED VALUE of Furniture, Paintings, Books, &c.	1,000	0	0			
			4,100	0	0	
IX. ARREARS OF SUBSCRIPTIONS considered recoverable			318	8	6	
X. BALANCES at 30th November 1924			1,994	15	6	
	AMOUNT OF GENERAL FUNDS		£126,988	5	10	
XI. SPECIAL FUNDS—						
TWEEEDDALE MEDAL FUND—						
Heritable Bond, at 5 per cent			£500	0	0	
Sum on Deposit Receipt with British Linen Bank			79	10	10	
					£579 10 10	
FIFE AND KINROSS PERPETUAL CHALLENGE CUP—						
£268 London and North-Eastern Railway Co. 3 per cent						
Debenture Stock, at 63½	£170	15	0			
£201 Do. do. 4 per cent First						
Guaranteed Stock, at 82½	166	6	6			
Sum on Deposit Receipt with British Linen Bank	34	1	3			
				371	2	9
PAISLEY GOLD CUP FUND—						
£802 London and North-Eastern Railway Co. 3 per cent						
Debenture Stock, at 63½	£511	5	6			
Sum on Deposit Receipt with British Linen Bank	73	17	4			
				585	2	10
RENFREWSHIRE GOLD CUP FUND—						
£668 London and North-Eastern Railway Co. 3 per cent						
Debenture Stock, at 63½	£425	17	0			
Sum on Deposit Receipt with British Linen Bank	68	3	5			
				494	0	5
WILLIAM TAYLOR MEMORIAL PRIZE FUND—						
£401 London and North-Eastern Railway Co. 3 per cent						
Debenture Stock, at 63½	£255	12	8			
Sum on Deposit Receipt with British Linen Bank	56	16	3			
				312	8	11
WILLIAM DUTHIE CHALLENGE CUP FUND—						
£260 2½ per cent Consolidated Stock, at 58½			151	9	0	
BALANCES WITH BRITISH LINEN BANK at 30th November 1924			60	4	8	
	AMOUNT OF SPECIAL FUNDS		£2,553	19	5	

DAVID WILSON, *Treasurer.*

J. T. M'LAREN, *Chairman.*

WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, 7th January 1925.

ABSTRACT of the ACCOUNTS of the HIGHLAND and CHARGE,

1. BALANCES as at 30th November 1923				£1,381 13 11
2. ARREARS of Subscriptions outstanding at 30th November 1923			£355 3 6	
Whereof due by Members who have compounded for life, and whose arrears are thereby extinguished	£11 0 0			
Sums ordered to be written off	162 13 6			
			<u>173 13 6</u>	181 10 0
3. INTERESTS AND DIVIDENDS—				
(1) Interests—				
On Heritable Bonds, less Income-tax		£662 12 6		
On Railway Debenture and Preference Stocks, do.		1,343 18 1		
On Colonial Government Stock, do.		340 13 5		
On Annuity Stock, do.		24 16 0		
On Edinburgh Corporation Loans, do.		49 7 7		
On British Government Stocks, do.		997 10 10		
		<u>£3,418 18 5</u>		
(2) Dividends on Bank Stocks, less Income-tax		1,188 14 0		
			<u>4 607 12 5</u>	
4. SUBSCRIPTIONS—				
Annual Subscriptions		£2,604 16 6		
Life Subscriptions		1,213 4 0		
		<u>3,818 0 6</u>		
5. 'TRANSACTIONS'—Advertisements and Sales				36 4 7
6. INCOME-TAX repaid for year to 5th April 1924				1,068 11 3
7. RECEIPTS from Inverness Show, 1923				169 6 5
8. RECEIPTS from Perth Show, 1924				17,798 6 6
9. INVESTMENTS realised				3,500 0 0
10. TEMPORARY LOANS uplifted.				<u>5,000 0 0</u>
SUM OF CHARGE				£37,561 5 7

AGRICULTURAL SOCIETY of SCOTLAND for Year 1923-1924.

DISCHARGE.

1. ESTABLISHMENT EXPENSES—			
Salaries and Wages—Secretary, £1229, 8s. 4d.; Chief Clerk, £600; other Clerks, £422, 18s. 4d.; Typist, £140; Messenger's Wages, £170 . . .	£2,562	1	8
Cleaning, £53; Retiring Allowance to Mrs Simpson, £30 . . .	83	0	0
Fen-duty, £21, 14s.; Taxes, £96, 6s. 8d.	118	0	8
Coal, Gas, and Electric Light	75	2	8
Repairs and Furnishings, £40, 16s. 10d.; Telephone and Telegrams, £50, 15s.; Insurance, £24, 14s. 11d.; Special Annuity Premiums, £85, 16s.	212	2	9
	£3,050	7	9
2. FEE to Auditor of Accounts for 1922-1923	75	0	0
3. EDUCATION—N.D.A. Examination	78	11	6
4. CHEMICAL DEPARTMENT—			
Fee to Chemist	£100	0	0
Analyses for Members and Expenses	403	5	3
	503	5	3
5. VETERINARY DEPARTMENT—			
Medals to Students	£23	2	0
Expenses in connection with Grass Sickness Investigation	124	17	4
	147	19	4
6. BOTANICAL AND ENTOMOLOGICAL DEPARTMENT	25	0	0
7. DAIRY DEPARTMENT—			
Expenses of Examination held at Kilmarnock	£285	4	9
Less Entry Fees	179	11	0
	105	13	9
8. SOCIETY'S 'TRANSACTIONS'	1,731	0	6
9. ORDINARY Printing, £177, 4s. 8d.; Advertising, £56, 9s. 6d.; Stationery, Books, &c., £115, 16s. 9d.; Postages, &c., £115; Bank and Post Office Charges, £10, 19s. 8d.	475	10	2
10. SALARY of Consulting Engineer	150	0	0
11. GRANT to Public Society	5	0	0
12. SPECIAL DONATIONS	36	1	0
13. MISCELLANEOUS Payments	209	4	3
14. INVESTMENTS made	7,686	14	0
15. SUMS lodged on Temporary Loan	4,000	0	0
16. EXPENSES in connection with Inverness Show, 1923	365	15	0
17. EXPENSES in connection with Perth Show, 1924—			
Premiums, £3318, 5s.; Medals, £30, 6s.; Expenses as per Show Account, £12,397, 12s. 8d. (see page 391)	15,741	3	8
18. EXPENSES in connection with future Shows	48	10	8
19. PREMIUMS and Medals for Local Shows and District Competitions	542	12	0
20. CERTIFICATES and Medals for Long Service	98	7	9
21. EXPENSES in connection with Investigations and Deputations	30	14	0
22. ARREARS removed from Subscription List at 30th November 1924	141	11	0
23. ARREARS of Subscriptions outstanding at 30th November 1924	318	8	6
24. BALANCES at 30th November 1924—			
On Account Current with Royal Bank of Scotland—			
Edinburgh Account	£1,780	1	6
London Account	200	0	0
	£1,980	1	6
In hands of Secretary	14	14	0
	1,994	15	6
SUM OF DISCHARGE	£37,561	5	7

DAVID WILSON, *Treasurer.*
J. T. M'LAREN, *Chairman.*
WM. HOME COOK, C.A., *Auditor.*

ABSTRACT of the ACCOUNTS

CHARGE.

1. LOCAL SUBSCRIPTION—

Town Council of Perth	£100 0 0
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2. AMOUNT COLLECTED DURING SHOW—

Gates	£8,111 0 5
Grand Stand	1,530 16 10
Catalogues and Awards	808 9 10
Tickets sold	30 5 4
Rent of Motor Garage and Chauffeurs' Tickets	207 4 6
Cloak-Rooms and Lavatories	55 16 6
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	10,743 13 5

3. FORAGE SOLD	14 10 11
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4. RENT OF STALLS	5,623 7 0
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5. DO. REFRESHMENT BOOTHS	475 0 0
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6. ADVERTISEMENTS IN CATALOGUE AND PREMIUM LIST	297 8 0
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7. SUBSCRIPTIONS IN AID OF PREMIUMS	470 0 0
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8. TELEPHONE CALLS IN SHOWYARD	48 4 8
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9. BANK INTEREST	26 2 6
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£17,798 6 6
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£17,798 6 6

<i>Note.</i> From the above balance of	£2057 2 10
Deduct Premiums undrawn at 30th November	200 0 0

£1857 2 10

To the above balance there falls to be added sums due by Exhibitors for fitting up stands, amounting to	479 11 5
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Making probable surplus	<u>£2336 14 3</u>
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EDINBURGH, 7th January 1926.

of the PERTH SHOW, 1924.

DISCHARGE.

1. SHOWYARD—			
Fitting up Showyard			£3,540 0 0
Bell & Sime—Hire of Timber	£2,385	8 2	
John Reid, Showyard Plant	149	0 7	
			2,534 8 9
Rosettes, £81, 18s. ; Penning Poultry, £51, 6s. .	£133	4 0	
Railway Carriages, Luggage, Catalogues, Turn- stiles, Sleepers	43	19 7	
Cartage	40	4 10	
Garvie & Syme—Fire Extinguishers	9	13 8	
Gas to Dairy Stand, £2, 6s. 9d. ; Storing Turn- stiles, £4, 10s.	6	16 9	
			233 18 10
Salary to John Reid, Showyard Erector			500 0 0
2. FORAGE and Bedding for Stock			632 8 6
3. POLICE			124 9 9
4. TRAVELLING EXPENSES of Judges, Stewards, &c.			349 4 7
5. HOTELS AND LUNCHEONS—			
Hotels for 34 Directors, 14 Stewards, and 37 Judges	£478	2 6	
Luncheons in Showyard for Directors, Judges, Attending Members, Members of Committee, Staff, and Breakfasts, Rooms, &c.	553	4 7	
			1,031 7 1
6. ASSISTANTS and Attendants			477 7 8
7. MUSIC			136 0 0
8. PRINTING, Members' Badges, and Stationery			1,575 1 7
9. ADVERTISING and Bill-posting			733 2 8
10. GRANT to Highland Industries Stand			5 0 0
11. GRANT to Forestry Exhibit			20 0 0
12. VETERINARY INSPECTION			10 10 0
13. CONCERT for Attendants			13 12 6
14. SHOW TREASURER			50 0 0
15. POSTAGES			130 0 0
16. POST OFFICE and Telephones			62 8 1
17. AMBULANCE			10 10 0
18. MISCELLANEOUS			101 2 8
19. ENTRY FEES returned on account of Foot-and-Mouth Disease			127 0 0
			£12,397 12 8
20. PREMIUMS drawn at 30th November 1924			3,343 11 0
			£15,741 3 8
CR. BALANCE			2,057 2 10
			£17,798 6 6

DAVID WILSON, *Treasurer.*J. T. M'LAREN, *Chairman.*WM. HOME COOK, C.A., *Auditor.*

ABSTRACT of the ACCOUNTS of the CHARGE.

I. FUNDS as at 30th November 1923—

Amount on Heritable Loan at $4\frac{1}{2}$ per cent	£3,500 0 0	
£3,193 London and North-Eastern Railway Company 3 per cent Debenture Stock, purchased at	2,650 0 0	
£926, 18s. 3d. $3\frac{1}{2}$ per cent Conversion Loan, purchased at	709 19 4	
£500 Queensland $3\frac{1}{2}$ per cent Inscribed Stock, 1950-70, pur- chased at	450 1 0	
£412 London Midland and Scottish Railway Company 4 per cent Debenture Stock, purchased at	611 10 6	
£190 London Midland and Scottish Railway Company 4 per cent Guaranteed Stock, purchased at	259 1 11	
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	£8,180 12 9	
BALANCE on Account Current with Royal Bank of Scotland	155 8 8	
	<hr/>	
	£8,335 16 0	

II. INTEREST ON INVESTMENTS—

On £3500 on Heritable Loan at $4\frac{1}{2}$ per cent, for year to Martinmas 1924	£166 5 0	
Less tax	37 8 0	
	<hr/>	
	£128 17 0	
On £3193 London and North-Eastern Railway Company 3 per cent Debenture Stock, for year to 30th June 1924	£95 15 10	
Less tax	21 11 0	
	<hr/>	
	74 4 10	
On £926, 18s. 3d. $3\frac{1}{2}$ per cent Conversion Loan, for year to 1st October 1924	£32 8 8	
Less tax	7 5 10	
	<hr/>	
	25 2 10	
On £412 London Midland and Scottish Rail- way Company 4 per cent Debenture Stock, for year to 30th June 1924	£16 9 6	
Less tax	3 14 9	
	<hr/>	
	12 15 6	
On £500 Queensland $3\frac{1}{2}$ per cent Inscribed Stock, 1950-70, for year	17 10 0	
On £190 London Midland and Scottish Rail- way Company 4 per cent Guaranteed Stock, for year to 30th June 1924	£7 12 0	
Less tax	1 14 2	
	<hr/>	
	5 17 10	
	<hr/>	
	264 8 0	
III. INCOME-TAX repaid for year to 5th April 1924	77 14 11	
	<hr/>	
SUM OF CHARGE	£8,677 18 11	

ARGYLL NAVAL FUND for the Year 1923-1924.**DISCHARGE.****I. ALLOWANCES to the eight following Recipients—**

I. G. Maclean (ninth year)	. . . . .	£40 0 0
A. F. Campbell (seventh year)	. . . . .	40 0 0
R. A. Forbes (fifth year)	. . . . .	40 0 0
J. H. Forbes (third year)	. . . . .	40 0 0
D. G. Macintyre (third year)	. . . . .	40 0 0
I. H. Dundas (second year)	. . . . .	40 0 0
C. D. Bonham-Carter (second year)	. . . . .	40 0 0
W. J. R. Campbell (first year)	40 0 0
		<hr/>
		£320 0 0

II. ADVERTISING—

Messrs H. Munro, Ltd.	9 3 3
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III. FUNDS at 30th November 1924—

Amount on Heritable Loan at $4\frac{1}{2}$ per cent.	£3,500 0 0
£3,193 London and North-Eastern Railway Company 3 per cent Debenture Stock, pur- chased at		2,650 0 0
£926, 16s. 3d. $3\frac{1}{2}$ per cent Conversion Loan, purchased at		709 19 4
£500 Queensland $3\frac{1}{2}$ per cent Inscribed Stock, 1950-70, purchased at		450 1 0
£412 London Midland and Scottish Railway Company 4 per cent Debenture Stock, pur- chased at		611 10 6
£190 London Midland and Scottish Railway Company 4 per cent Guaranteed Stock, purchased at		259 1 11
		<hr/>
		£8,180 12 9

Note.—The above Funds are entered at cost.
The value at 30th November 1924
was £7152, 18s. 9d.

Balance on Account Current with Royal Bank of Scotland	168 2 11	
	<hr/>	8,348 15 8
SUM OF DISCHARGE		£8,677 18 11

DAVID WILSON, *Treasurer.*
J. T. M'LAREN, *Chairman.*
WM. HOME COOK, C.A., *Auditor.*

VIEW OF RECEIPTS AND PAYMENTS

For the Year 1923-1924.

RECEIPTS.

1. ANNUAL SUBSCRIPTIONS AND ARREARS received	£2,326	7	0
2. LIFE SUBSCRIPTIONS	1,213	4	0
3. INTERESTS AND DIVIDENDS—			
Interests	£3,418	18	5
Dividends	1,188	14	0
			<u>4,607 12 5</u>
4. 'TRANSACTIONS'—Advertisements and Sales	36	4	7
5. INCOME-TAX repaid for year to 5th April 1924	1,068	11	8
6. RECEIPTS from Inverness Show, 1923	169	6	5
7. RECEIPTS from Perth Show, 1924	17,798	6	6
			<u>£27,219 12 2</u>

PAYMENTS.

1. ESTABLISHMENT EXPENSES—			
Salaries and Wages	£2,562	1	8
Cleaning and Retiring Allowances	83	0	0
Fou-duty, Taxes, Coal, Gas and Electric Light, Insurance, Repairs, and Furnishings	405	6	1
			<u>£3,050 7 9</u>
2. FEE TO AUDITOR of Accounts, 1922-1923	75	0	0
3. EDUCATION—N.D.A. Examination	78	11	6
4. CHEMICAL DEPARTMENT	503	5	8
5. VETERINARY DEPARTMENT	147	19	4
6. BOTANICAL AND ENTOMOLOGICAL DEPARTMENT	25	0	0
7. DAIRY DEPARTMENT	105	13	9
8. SOCIETY'S 'TRANSACTIONS'	1,731	0	6
9. ORDINARY Printing, Advertising, Stationery, Books, Postages, and Bank Charges	475	10	2
10. SALARY of Consulting Engineer	150	0	0
11. GRANT to Public Society	5	0	0
12. SPECIAL Donations	36	1	0
13. MISCELLANEOUS Payments	209	4	3
14. PAYMENTS on account of Inverness Show, 1923	365	15	0
15. PAYMENTS on account of Perth Show, 1924—			
Premiums	£3,343	11	0
Expenses	12,397	12	8
			<u>15,741 3 8</u>
16. EXPENSES in connection with future Shows	48	10	8
17. PREMIUMS AND MEDALS for Local Shows and Dis- trict Competitions	542	12	0
18. CERTIFICATES AND MEDALS for Long Service	98	7	9
19. EXPENSES in connection with Investigations and Deputations	30	14	0
			<u>23,419 16 7</u>
BALANCE OF RECEIPTS	£3,799	15	7

DAVID WILSON, *Treasurer.*
J. T. M'LAREN, *Chairman.*
WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, 7th January 1925.

PROCEEDINGS AT BOARD MEETINGS.

MEETING OF DIRECTORS, 2ND APRIL 1924.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—Ordinary Directors—The Earl of Elgin and Kincardine, C.M.G.; Mr Thomas A. Buttar; Colonel F. J. Carruthers; Mr Thomas Elder; Mr Thomas Elliot; Mr Alexander Forbes; Mr James Grieve; Sir John A. Hope, Bart.; Lieut.-Col. W. T. R. Houldsworth; Mr A. B. Leitch; Mr James R. Lumsden; Mr Duncan M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Mr Alexander Murdoch; Mr Alexander Robertson; Mr James Rodger; Major R. W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Major Mark Sprot; Mr John Stewart; Mr Falconer L. Wallace; Mr George Will. *Extraordinary Directors*—Mr James Durno; Mr Robert Jeffrey; Mr W. P. Gilmour; Mr J. E. Kerr; Mr James M'Laren; Mr Hugh Martin; Mr William Meiklem; Hon. A. D. Murray; Mr Norman J. Nasmyth; Mr William S. Niven; Mr John M. Roger; Sir Hugh Shaw Stewart, Bart., C.B.; Mr Phipps O. Turnbull. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Auditor*—Mr William Home Cook. *Consulting Chemist*—Dr J. F. Tocher.

Letters.

The following letters were submitted :—

Mrs Nicolson, Glenberrie.—Thanks for Minute of sympathy on the death of her husband, the late Mr A. B. Nicolson.

Family of the late William Clark.—Thanks for Minute of sympathy on the death of their father, the late Mr William Clark, Netherlea.

Perth Branch, B.W.T.A.—Thanks for free site for refreshment stand at Perth Show.

Board of Agriculture for Scotland.—Thanks for use of Society's Hall for Meeting of Scottish Council of Agriculture.

Foot-and-Mouth Disease.

A letter from Sir Stewart Stockman, dated 24th March, was read. In this letter he explained that all sacks found on infected premises were destroyed, as it did not pay to disinfect them. With regard to the employment of an Auctioneer from a clean area to value stock in an infected area, he pointed out that a local Valuer was usually employed, although, in certain circumstances, a suitable local Valuer might not be available. Where a Valuer was taken from a clean area, the greatest care was exercised with regard to disinfection of his clothing, and they had never had a case of foot-and-mouth disease which could be attributed to infection carried by a Valuer.

Perth Show, 1924.

Attending Members.—The following Directors were appointed as Attending Members : *Shorthorn*—Alexander Robertson and G. B. Shields; *Dairy Shorthorns*—James Rodger; *Aberdeen-Angus and Fat Cattle*—William S. Niven and George Will; *Galloway*—James M'Queen; *Highland*—Hon. A. D. Murray; *Ayrshire*—Andrew B. Leitch and John M. Roger; *British-Friesian*—Thomas Elder and James Gray; *Red Poll*—Falconer L. Wallace; *Belted Galloway*—Sir David Wilson, Bart.; *Draught Stallions*—James Durno and John P. Sleigh; *Draught*

Mares—Robert Jeffrey and William Meiklem; *Hunters*—Colonel F. J. Carruthers; *Hackneys, Ponies, and Harness Horses*—The Earl of Elgin and Kincardine, C.M.G.; *Highland Ponies*—Hugh Martin; *Western Island Ponies*—Sir Hugh Shaw Stewart, Bart., C.B.; *Shetland Ponies*—Lieut.-Colonel W. T. R. Houldsworth; *Blackface Sheep*—Thomas Elliot and James Grieve; *Cheviot*—Alexander Niven; *Border Leicester*—Thomas Kirk; *Half-Bred and Fat Sheep*—Norman J. Nasmyth; *Oxford Down*—William Tod; *Suffolk*—Captain John MacGillivray; *Shropshire and Dorset Horn*—A. A. Hagart Speirs; *Goats*—Major J. Kemp Smith; *Large White Pigs*—Archibald Whyte; *Middle White*—General Sir Walter Charteris Ross, K.B.E., C.B.; *Large Black*—William Low; *Gloucestershire Old Spots and Cumberland*—Major R. W. Sharpe; *Poultry*—Dr J. F. Tocher; *Dairy Produce*—John Stewart; *Bee Appliances and Honey*—Dr R. Stewart MacDougall.

Local Committee.—The SECRETARY reported that, at a Meeting of Local Directors held at Perth on 21st March, additional members of the Local Committee of Management from the Perth Show Division had been appointed.

Rural Industries Section.—The SECRETARY reported that the following had accepted appointment as Judges in the Rural Industries Section at the Show: Miss Bruce, 111 George Street, Edinburgh—Classes 1, 5, 6, 7, 16, and 17; Miss Moir, 15 George Street, Perth, and Mrs Robert Hunter, St John's, Glasgow Road, Perth—Classes 2, 3, 4, 19, 20, 22, and 23; Miss Pearce, Edinburgh Ladies' College, Queen Street, Edinburgh—Classes 8, 9, 13, 18, and 21; Mrs Geoffrey Gordon, 2 Eton Terrace, Edinburgh—Classes 10, 11, and 12; Miss Anne S. Morrison, Bon-Accord, 59 Balhousie Street, Perth—Class 14; Mr John Mitchell, Union Buildings, Aberdeen—Class 15.

Catering.—Minutes of Meetings of Catering Committee, dated 5th February and 5th March, were read and approved.

The Minutes recommended that there be four licensed catering stands in the Showyard, these to be in the hands of the following Caterers: Mr John Mitchell, Royal Athenaeum, Aberdeen; Messrs William Forbes, Ltd., 7 Gordon Street, Glasgow; Messrs Alexander Fairley & Son, 83 Leith Street, Edinburgh; and Messrs William & R. S. Kerr (Glasgow), Ltd., Baker Street, Shawlands Cross, Glasgow. The tea stand would again be in the hands of Mr John Henderson, Aberdeen. The British Women's Temperance Association would, as usual, have an unlicensed refreshment stand.

Free Stands.—It was agreed to grant the Royal (Dick) Veterinary College a free stand, with 10 feet frontage, adjoining the Edinburgh and East of Scotland College of Agriculture stand, and the Scottish War Savings Committee a small stand in proximity to the Post Office.

Special Prizes.—It was agreed to accept, with thanks, a contribution of £10, 10s. from the Scottish Beekeepers' Association towards the prize-money in the Classes for Bee Appliances and Honey.

Summer Time.

Mr JOHN STEWART of Struthers and Mr FALCONER L. WALLACE of Balcairn reported on the meeting of the Joint-Deputation with the Home Secretary on 7th April. The deputation had put forward the various arguments against the introduction of Summer Time, but the Home Secretary held out no hope of the Summer Time Bill being abandoned. The agricultural interests had to give way where the predominating industrial interests were concerned. The matter was further complicated through international agreements with France and Belgium; and the Home Secretary had pointed out that the views put forward by English farmers did not agree with those put forward from Scotland.

The CHAIRMAN, on behalf of the Board, thanked Mr Stewart and Mr Wallace for their services on the Joint-Deputation.

Proposed Conference on Cattle Breeding.

Mr G. B. SHIELDS, Dolphingstone, reported that he had attended on behalf of the Society a meeting in connection with the proposed Conference on Cattle Breeding. The meeting was called by the Animal Breeding Research Department, and was attended by a representative of the Board of Agriculture and representatives of several Breed Societies. Mr Shields gave details of what transpired at the meeting, from which it appeared that the various representatives, while personally inclined to favour the holding of a Conference, could not commit their respective Societies without first consulting these bodies and obtaining their authority. The meeting was informed that it was impossible to delay a month to obtain the authority of these bodies, and Dr Crew eventually announced that the Animal Breeding Research Department would proceed with the arrangements for the Conference without awaiting the decision of the Societies interested.

Mr Shields, while of opinion that too great haste had been shown in calling the Conference, advised Members of the Society and all breeders to attend the Conference, and do what they could to help the work the promoters were trying to perform. He did not think the date suggested, between the Royal and the Highland Shows, was a suitable time for the Conference, and, further, a one-day Conference could not touch the fringe of the subjects they proposed to discuss. It was suggested that excursions take place to breeding herds, but he felt strongly that, in view of the prevalence of foot-and-mouth disease, breeders would not be willing to expose their herds to the risk of infection which these visits would entail.

The CHAIRMAN, on behalf of the Board, thanked Mr Shields for his report, and expressed the hope that individual Members would do their best to give the Conference their support.

MEETING OF DIRECTORS, 7TH MAY 1924.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—Ordinary Directors—The Earl of Elgin and Kincardine, C.M.G.; Mr Thomas A. Buttar; Colonel F. J. Carruthers; Mr Thomas Elder; Mr Alexander Forbes; Mr James Gray; Mr James Grieve; Lieut.-Col. W. T. R. Houldsworth; Mr A. B. Leitch; Mr William Low; Mr James R. Lumsden; Mr John M'Caig; Captain John MacGillivray; Mr Duncan M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Mr Alexander Murdoch; Major R. W. Sharpe; Mr G. Bertram Shields; Mr A. A. Hagart Speirs; Mr John Speir; Major Mark Sprot; Mr John Stewart; Mr Falconer L. Wallace. *Extraordinary Directors*—Mr W. P. Gilmour; Mr Robert Jeffrey; Mr J. E. Korr; Mr Thomas Kirk; Mr James M'Laren; Mr Robert MacMillan; Mr William S. Niven; Sir Hugh Shaw Stewart, Bart., C.B.; Mr William Tod; Mr Phipps O. Turnbull; Mr Archibald Whyte. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Auditor*—Mr William Home Cook. *Consulting Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

The late Sir John A. Hope, Bart.

Before proceeding with the business of the meeting, the CHAIRMAN made sympathetic reference to the death of Sir John A. Hope of Craighall, Bart., Pinkie House, Musselburgh, which had taken place with tragic suddenness since their last meeting. He had not been long a Member of the Board, but he had a high sense of public duty, and was most regular in his attendance at their meetings, and had always taken a helpful part in their deliberations. An appropriate resolution of regret and sympathy was submitted and approved, the Members present upstanding, and the Secretary was instructed to forward a copy thereof to Lady Hope and the family of the deceased.

Letters.

The following letters were submitted:—

Lady Stewart-Clark, Dundas Castle.—Thanks for Minute of sympathy on the death of her husband, the late Sir John Stewart-Clark, Bart.

Board of Agriculture for Scotland.—Communication regarding loans to Agricultural Co-operative Societies.

Proposed National Dairy Council for Scotland.

A letter was submitted from the Board of Agriculture for Scotland, inviting the Society to appoint representatives to a Conference of the various associations and other bodies interested in the improvement of the milk supply, to be held in the City Chambers, Glasgow, on 27th May at 2 p.m. The Corporation of Glasgow were co-operating with the Board in arranging the Conference, which would be presided over by the Lord Provost of Glasgow. It was agreed that the members of the Special Committee appointed at the February Meeting be requested to represent the Society at the proposed Conference—viz.: Mr W. P. Gilmour, Lieut.-Col. W. T. R. Houldsworth, Mr John M'Caig, Mr John Speir, Sir Hugh Shaw Stewart, Bart., Mr George Will, and Sir David Wilson, Bart.

Perth Show, 1924.

A Minute of Meeting of Shows Committee, dated 7th May, was submitted and approved.

The Minute dealt with the following matters :—

Grants to Local Societies.—The Sub-Committee appointed on 5th December last had given careful consideration to the remit from the Shows Committee to consider the whole question of grants to local Societies. They had obtained information regarding the Cattle-Breeding schemes of the Board of Agriculture, the number of premiums given by the Board for bulls, and the number of bulls owned by the Board and lent out to crofting districts. After full consideration of all the facts, the Sub-Committee did not see their way to recommend any change in the Society's present system of grants, and this finding was endorsed by the Shows Committee.

Cooking by Attendants in Showyard.—The Committee had reconsidered the question of providing special accommodation for cooking of meals by attendants in the Showyard. It was recommended that no such special accommodation be provided, and that attendants be not prohibited from cooking meals in their private boxes as in the past. It was, however, agreed that fire-extinguishers be placed in suitable positions for use in case of fire.

Rule 35.—On a question of interpretation, it was decided that Rule 35, as to farrowing of pigs, should apply to Extra Stock animals as well as to those entered in the ordinary classes.

Local Committee.—The SECRETARY reported that, at a meeting of the Local Committee at Perth on 25th April, additional Attending Members had been appointed on the various classes of stock.

Attending Members.—Mr ARCHIBALD WHYTE, Inverquhar, drew attention to the fact that several Directors had been appointed as Attending Members on breeds in which they were interested. He mentioned in particular that two Shorthorn breeders were appointed Attending Members on Shorthorns, and two breeders of Clydesdales were appointed Attending Members on Clydesdales. In the past he understood that no Director interested in any special breed was appointed to that breed, and he thought that rule should continue to be observed.

Captain JOHN MACGILLIVRAY of Calrossie spoke in support of the views expressed by Mr Whyte.

After some discussion, the CHAIRMAN said that, as the matter had been sufficiently ventilated, such appointments were not likely to occur again.

Telephone Facilities in Rural Districts.

A Minute of Meeting of Law and Parliamentary Committee, dated 7th May, was submitted and approved.

The Minute stated that consideration had been given to a letter from Her Grace the Duchess of Atholl, M.P., in which she inquired as to the views of the Society with regard to the necessity for better telephone facilities for farmers in outlying districts. It was recommended that a reply be sent to the effect that the Directors are convinced that there is a real demand for increased telephone facilities amongst farmers in outlying districts of Scotland, and they were gratified to learn that Her Grace proposed to take steps to bring this demand before the proper authorities.

Agricultural Education and Research.

The SECRETARY reported that the Society's representatives, Sir David Wilson, Bart., and Mr George Will, had given evidence before the Departmental Committee on Agricultural Education and Research on 28th April. The Summary of their evidence had been considered and approved by the Education Committee. They were subjected to a thorough cross-examination lasting for two and a half hours. He thought the Directors were fortunate in being represented by two such capable witnesses.

The CHAIRMAN thanked Sir David Wilson and Mr Will, on behalf of the Board, for the service they had rendered the Society in this matter.

Honorary Secretary.

A Minute of Meeting of Office-Bearers' Committee, dated 7th May, was read and approved.

The Minute stated that it was unanimously agreed to recommend that Sir Hugh Shaw Stewart of Greenock and Blackhall, Bart., C.B., be nominated to the General Meeting in June for appointment as Honorary Secretary of the Society, in place of the late Dr Charles Douglas.

MEETING OF DIRECTORS, 4TH JUNE 1924.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—*Vice-President*—Sir Ralph Anstruther of Balcaaskie, Bart. *Ordinary Directors*—Mr Thomas A. Buttar; Colonel F. J. Carruthers; Mr Thomas Elder; The Earl of Elgin and Kincardine, C.M.G.; Mr James Gray; Mr James Grieve; Mr A. B. Leitch; Mr William Low; Mr James R. Lumsden; Mr Duncan M'Laren; Mr J. T. M'Laren; Mr Alexander Robertson; Mr John P. Sleigh; Major R. W. Sharpe; Mr G. Bertram Shields; Mr A. A. Hagart Speirs; Major Mark Sprot; Mr John Stewart. *Extraordinary Directors*—Mr James Durno; Mr Robert Jeffrey; Mr Thomas Kirk; Robert Macmillan; Mr William Meiklem; Mr William S. Niven; Mr John M. Roger; Sir Hugh Shaw Stewart, Bart., C.B.; Mr William Tod; Mr Phipps O. Turnbull. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Consulting Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

Letters.

Lady Mary Hope, Pinkie House.—Thanks for Minute of sympathy on the death of her husband, the late Sir John A. Hope, Bart.

Scottish Cattle-Breeding Conference.—Letter from Dr G. F. Finlay, Organising Secretary, calling attention to the Conference to be held on 7th-11th July, enclosing copies of the Prospectus of the Conference, and requesting the Directors to assist the Committee by bringing the meeting to the notice of breeders and others interested.

Board of Agriculture for Scotland.—Communication regarding the provisional arrangements for a Conference on Potato Culture to be held on 20th and 21st August next.

The CHAIRMAN remarked that those present might be good enough to note the date, as the Conference would be well worthy of their attention.

Perth Show, 1924.

General Arrangements.—The CHAIRMAN said that the arrangements for the Show at Perth next month were proceeding satisfactorily, and they expected to have a successful Show. The entries of Cattle were not so numerous as last year, but that was largely, if not wholly, due to the outbreaks of foot-and-mouth disease. They had a meeting with the Perth Local Authorities a few days ago, and later with representatives of the Northern Counties, and these bodies were prepared to do everything in their power to overcome the present difficulties. They came to an arrangement that Stock would be received at the Show on Licence, and he did not think that, under existing conditions, this would entail any serious hardship on Exhibitors. He was afraid, however, that unless there was some modification or relaxation between that date and the date of the Show, Stock from England, or Scottish Stock exhibited at the Royal Show in England, would not be admitted. They still were hopeful that Stock might be received from South of the Border, but, at the moment, they must take it that Stock from the South were barred from coming to Perth Show.

Glasgow Show, 1925.

The SECRETARY said that, with a view to fixing the date of the Glasgow Show at that meeting, he had been in communication with the Secretary of the Royal Agricultural Society, with the Secretary of the Yorkshire Agricultural Society, and with the Lord Provost of Glasgow. The Royal Agricultural Society had not yet fixed the date of their Show at Chester for 1925, but the Secretary wrote that he did not know of any special circumstances which were likely to cause an alteration in their usual dates, and he thought it might be taken that the dates would be from 30th June to 4th July. The Secretary of the Yorkshire Society said their Show at Bradford would be held on the 22nd July and two following days. The Lord Provost of Glasgow pointed out that the Glasgow Fair holidays would start on the 18th July, and continue during the following week, so that the week preceding would be suitable for the Show.

It was accordingly unanimously agreed to fix the date of the Glasgow Show for the 14th-17th July 1925.

Border Show, 1926.

A Minute of Meeting of Sites Committee, dated 4th June, was read and approved. The Minute stated that the Committee were in possession of full details regarding the various sites, and the facilities available in connection with each. No decision had, however, been arrived at, and further consideration was deferred pending information being obtained from the Railway Companies with regard to the railway facilities available at each centre.

'Transactions.'

A Minute of Meeting of Publications Committee, dated 3rd June, was read and approved.

The Minute recommended payments to writers of articles in the current volume of 'Transactions,' amounting to £175, 8s.

The cordial thanks of the Committee were recorded to Mr Alexander Murdoch, East Hallside, Glasgow, who had presented to the Society Volumes II. and III. of the 'Transactions,' published in 1803 and 1807 respectively.

Inspection of growing crops of Potatoes.

Mr P. O. TURNBULL, Smeaton, Dalkeith, reported that he had attended, along with the Chairman and Secretary, a Conference called by the Board of Agriculture on 30th May, regarding the inspection of growing crops of Potatoes. The principal question was how they were to treat "wildings" and "bolters," two classes of tubers which could not be included under the designation "rogues." The feeling of the Conference was that steps should be taken to have these eliminated. The aim of the Board was to have as pure a crop as possible of Seed Potatoes to send to England. The Board were to issue instructions at some future date as to how these "wildings" and "bolters" were to be dealt with.

British Wool Federation.

A letter was read from the Secretary of the British Wool Federation, with regard to the serious decline in the world's wool production which had taken place in recent years, and suggesting that steps should be taken to encourage British farmers to increase their flocks. The number of sheep in this country was 24 millions, as against 31 millions fifteen years ago, and it was suggested that farmers should be strongly urged to consider the advisability of refraining from slaughtering Ewe Lambs.

Some discussion followed, but no action was decided upon.

National Dairy Council for Scotland.

A letter was read from Lieut.-Col. W. T. R. Houldsworth of Kirkbride, Maybole, stating that, along with several other members of the Highland Society's Committee, he had represented the Society at a Conference held at Glasgow, with regard to the formation of a National Dairy Council for Scotland. The meeting, he stated, was favourable to the idea of such a Council being formed, and a Resolution to that effect was carried. Without in any way committing the Society, he had stated that the Directors were of opinion that the object aimed at was a commendable one, and that if such a Council was found feasible, the Society would no doubt be prepared to give it their support.

On the motion of the CHAIRMAN, the Society's representatives were thanked for their services in the matter.

New Members.

The SECRETARY reported that there was a list of 267 Candidates for election as Members of the Society at the Half-Yearly General Meeting to be held that afternoon.

MEETING OF DEPUTATION OF DIRECTORS HELD IN SHOWYARD,
PERTH, 16TH JULY 1924.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—*Vice-President*—The Hon. John Dewar. *Ordinary Directors*—Mr Thomas A. Buttar; Colonel F. J. Carruthers; Mr Thomas Elder; The Earl of Elgin and Kincardine, C.M.G.; Mr Thomas Elliot; Mr James Gray; Mr James Grieve; Lieut.-Col. W. T. R. Houldsworth; Mr Andrew B. Leitch; Mr William Low; Mr James R. Lumsden; Mr John M'Caig; Mr Duncan M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Mr Alexander Robertson; Mr James Rodger; Mr G. Bertram Shields; Mr John Speir; Mr A. A. Hagart Speirs; Major Mark Sprot; Mr John Stewart; Mr Falconer L. Wallace; Mr George Will. *Extraordinary Directors*—Mr James Durno; Mr W. P. Gilmour; Mr Robert Jeffrey; Mr J. Ernest Kerr; Mr James M'Laren; Mr Robert Macmillan; Mr William Meiklen; Mr Norman J. Nasmyth; Mr Alexander Niven; Major James Kemp Smith; Mr William Tod; Mr Phipps O. Turnbull; Mr Archibald Whyte. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Sir Hugh Shaw Stewart, Bart., C.B. *Consulting Engineer*—Professor R. Stanfield. *Consulting Entomologist*—Dr R. Stewart MacDougall.

Protests.

The SECRETARY reported that no Protests had been lodged.

Precepts.

The Chairman was authorised to sign the Precepts for the Prizes awarded at the Perth Show.

Ambulance.

It was agreed that a Donation of £10, 10s. be given to the Perth Branch of the St Andrew's Ambulance Association for their services in connection with the Show.

MEETING OF DIRECTORS, 5TH NOVEMBER 1924.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—*President*—The Lord Blythswood, K.C.V.O. *Ordinary Directors*—Mr Harry Armour; Colonel F. J. Carruthers; Mr Thomas Elder; Mr John Elliot; Mr Thomas Elliot; Mr William Elliot; Mr J. E. Kerr; Mr William Low; Mr John M'Caig; Mr Robert Macmillan; Mr James Rodger; Major R. W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr A. A. Hagart Speirs; Major Mark Sprot; Mr John Stewart; Mr Falconer L. Wallace; Mr George Will. *Extraordinary Directors*—Mr Thomas A. Buttar; Mr N. H. Constable; Mr James Durno; Mr James Gardner; Mr W. P. Gilmour; Mr James Grieve; Mr James R. Lumsden; Mr James M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Mr Alexander Murdoch; Major James Kemp Smith. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Sir Hugh Shaw Stewart, Bart., C.B. *Consulting Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

The late Andrew B. Leitch, Inchstelly.

Before proceeding with the business of the Meeting, the CHAIRMAN referred in sympathetic terms to the death of Mr Andrew B. Leitch, Inchstelly, Forres, who had been a valued member of the Board for many years. Mr Leitch, he said, had acted for several years as a judge of New Implements at the annual Shows, and they all knew how successfully he had discharged the duties of Convener of the Shows Committee on the occasion of the Show at Inverness in 1923. Besides his varied activities in connection with that Society, he was prominently identified with the agricultural affairs of his own district.

The late E. Hedley Smith, Whittingehame.

The CHAIRMAN also referred to the loss the Society had sustained through the death of Mr E. Hedley Smith, Whittingehame. They all knew, he said, the deep interest Mr Smith had taken in Agriculture and in the public business of his own district. He had been a member of the Board for several years, and was well known as an authority on Agriculture in the Lothians.

Appropriate resolutions of regret and sympathy were read and approved, the members present upstanding, and the Secretary was instructed to forward copies to the relatives of the deceased.

Chairman of the Board for 1924-25.

On the Motion of Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B., seconded by Sir DAVID WILSON of Carbeth, Bart., D.Sc., Mr J. T. M'Laren, The Leuchold, Dalmeny, was unanimously re-elected Chairman of the Board for the ensuing year.

Mr J. T. M'LAREN, in accepting office, thanked the Directors for the high honour which they had conferred upon him.

Representatives on other Bodies.

The following were appointed representatives of the Society on the Boards of the undernoted institutions for the ensuing year—viz.: *National Agricultural Examination Board*—G. Bertram Shields, Dolphingstone, Tranent, to fill the vacancy caused by the death of Dr Charles Douglas. *Edinburgh and East of Scotland College of Agriculture*—John Sturton, Secretary, Highland and Agricultural Society. *West of Scotland Agricultural College*—Sir Hugh Shaw Stewart of Greenock and Blackhall, Bart., C.B., Ardgowan, Inverkip. *Aberdeen and North of Scotland College of Agriculture*—Dr J. F. Tocher, 41½ Union Street, Aberdeen. *Royal (Dick) Veterinary College*—Thomas Kirk of Abbey Mains, Haddington. *Glasgow Veterinary College*—James R. Lumsden of Arden, Dumbar-tonshire. *Scottish Milk Records Association*—John McCaig of Belmont, Stranraer; Sir Hugh Shaw Stewart of Greenock and Blackhall, Bart., C.B.; Alexander Murdoch, East Hallside, Hallside, Lanarkshire. *Standing Committee of Management of Scottish Plant Registration Station*—Sir David Wilson, Bart.; James Elder, Athelstaneford Mains, Drem; G. Bertram Shields.

Letters.

Highland Reel and Strathspey Society.—Thanks for use of Society's Hall.

Mr John C. Drennan, Carse Hall, Linavady, Ireland.—Renewed application for Long Service Certificate and Medal for Robert Montgomery. It was decided to adhere to the former decision that this award could not be given to farm servants outside of Scotland.

Belgian International Exhibition.—A letter was submitted from the Board of Agriculture forwarding particulars of an International Exhibition of the latest equipment in connection with Household Management in Urban and Rural Districts, to be held at Heysel-Laeken, Belgium, from 15th July to 15th August 1925.

Perth Show, 1924.

Accounts.—The Finance Committee reported that a Summary of the Accounts of the Perth Show had been submitted, showing a probable credit balance on the Show of about £2177.

List of Awards.—The List of Awards at the Perth Show was laid on the table.

Glasgow Show.

Dates of Show.—The SECRETARY stated that at the Meeting of the Board in June, it was decided that the Glasgow Show be held from 14th to 17th July, the dates being fixed after correspondence with the Secretary of the Royal Agricultural Society of England, the Secretary of the Yorkshire Agricultural Society, and the Lord Provost of Glasgow. Since then the Royal Agricultural Society had decided to hold their Show from 7th to 11th July. That was the week immediately preceding the Highland Show. It had been usual to have a clear week between the two Shows, and that had been found to be a convenient arrangement, especially for implement exhibitors who could not duplicate their exhibits, and

had to remove them from one Show to the other. The Society were faced with the difficulty that if they were to hold their Show a week later, it would come into the Glasgow Fair week, which, he understood, was an impossible time to hold a Show in Glasgow. After considering the matter, the Shows Committee had expressed the view that the dates fixed should be adhered to.

After some discussion the recommendation of the Shows Committee was adopted.

Forage.—The following Committee was appointed to make arrangements for supply of Forage and report to the Board: Mr James M'Laren (*Convener*), Mr N. H. Constable, Mr Alexander Forbes, Mr James Gardner, Mr W. P. Gilmour, Mr John M'Caig, Mr A. W. Montgomerie, Mr Alexander Murdoch, Mr Alexander Robertson, Mr John Speir, and Mr George Will.

Hotel Accommodation and Catering in Showyard.—It was remitted to the Chairman of the Board, the Chairman of the Shows Committee, the Convener of the Local Committee, the Steward of Catering, and the Secretary to make the necessary arrangements.

Forestry Exhibition.—It was agreed that the usual space be granted to the Royal Scottish Arboricultural Society for an exhibition of timber, and also a grant of £20 to be awarded in prizes for timber.

Show Contracts.—It was remitted to the following Special Committee, with powers, to arrange the contracts for timber, and other contracts in connection with the Showyard: Mr John Speir (*Convener*), Mr T. A. Buttar, Colonel F. J. Carruthers, Mr James R. Lumsden, Mr James M'Laren, Mr W. S. Niven, Sir Hugh Shaw Stewart, Mr John Stewart, Mr George Will, and Professor Stanfield.

Prize List and Regulations.—The Secretary stated that the Shows Committee had met on 4th November, and had revised the Premium List and Regulations for the Glasgow Show.

It was proposed that, as usual, their report be printed and issued for consideration in detail at next Meeting of the Board.

The Board approved of this course.

Special Prizes.—The following Special Prizes were accepted, and votes of thanks accorded to the donors:—

- (1) *Scottish Shorthorn-Breeders' Association*—£20, to be awarded in prizes of £10, £5, £3, and £2, for Shorthorn Heifers calved on or after 1st April 1924.
- (2) *Galloway Cattle Society*—Dr Gillespie Memorial Challenge Trophy, on the same conditions as formerly.
- (3) *Lady Rachel Workman MacRobert, Douneside, Tarland*—The MacRobert Champion Silver Bell, value 50 guineas, for the best animal in the British Friesian Classes, registered in or eligible for entry in the British Friesian Cattle Society's Herd-Book, "Extra Stock" which have not previously won the Bell being eligible to compete.
- (4) *Red Poll Cattle Society*—£30 towards the prizes in the Red Poll Classes.
- (5) *R. W. R. Mackenzie of Earls Hall*—Silver Cup for best Shetland Pony of either sex and any age, drawn from ordinary Classes, and shown in saddle.
- (6) *Shetland Ponies*—Special Prize of £10, by "Five Lovers of the Breed," per Mr W. Mungall of Transy, for the best group of a Male and two Females of any age.
- (7) *Cheviot Sheep Society*—Perpetual Challenge Cup, value £25, gifted by Mr J. Borthwick, for best sheep in the Cheviot Classes.
- (8) *Society of Border Leicester Sheep Breeders*—Two Gold Medals for best Male and best Female of the breed exhibited in the ordinary classes—animals entered as "Extra Stock" not eligible.
- (9) *Mr Dugald M'Kechnie, Glasgow*—Special Prizes of £7, 7s. and £3, 3s. for best and second-best groups of Suffolk Sheep, comprising Ram, Ram Lamb, Shearling Ewe, and Ewe Lamb, on same conditions as at Perth.
- (10) *Large Black Pig Society*—£25 towards the prizes in the Large Black Pig Classes, and a Champion Silver Cup, value 10 guineas, for the best Large Black Pig.
- (11) *Cumberland Pig-Breeders' Association*—£20 towards the prizes in the Cumberland Pig Classes.
- (12) *Aberdeen-Angus Cattle Society*—Champion Gold Medal, value £10, for the best animal in the Breeding Classes—breeding animals shown as "Extra Stock" being eligible to compete.

Congratulations to Ayrshire Cattle Herd-Book Society.

On the Motion of Mr G. BERTRAM SHIELDS, it was unanimously agreed that the Secretary be instructed to convey to the Ayrshire Cattle Herd-Book Society the cordial congratulations of the Directors on the high position attained by

Ayrshire Cattle, and especially on the fact that Ayrshires had been successful, both last year and this year, in carrying off the supreme Championship at the Dairy Show in London.

Science.

A Minute of Meeting of Science Committee, dated 5th November, was read and approved.

The Minute stated that an application had been received for a Grant of £200 to meet the cost of field experiments in Scotland, in connection with the Joint Investigation into "Grass Sickness" in Horses being conducted by the Ministry of Agriculture's Research Institute, the Royal Veterinary College Research Institute, and the Animal Diseases Research Association. In view of the fact that, on 7th March 1923, the Directors, in voting a sum of £400 to cover the cost of toxin anti-toxin inoculations, had expressly stated that "this would be a final Grant to complete the Investigation," the Committee recommended that the application be not granted.

Show of 1926.

A Report by the Special Committee appointed to look out for a suitable site in the Border District for the Show of 1926 was submitted.

The Report dealt in detail with the various sites visited and inspected by the Committee at Berwick-upon-Tweed, Kelso, Peebles, and Hawick. It also contained particulars of the negotiations with the L. & N. E. Railway Company with regard to the railway facilities available at the three last-named centres. The Committee had decided, by a majority, to recommend that the Show of 1926 be held at Peebles, where a suitable and convenient site, with a free supply of water, was offered by the Town Council, together with a donation which it was expected would reach £1000, and of which £750 was already definitely promised.

On the motion of the CHAIRMAN, the Report of the Committee was unanimously adopted.

Proposed National Dairy Council for Scotland.

The SECRETARY reported that, during August, a communication had been received from the Board of Agriculture with regard to the proposed National Dairy Council for Scotland, in which the Society was requested to nominate a representative on a Provisional Council to be appointed, pending the formation of a permanent Council. After consultation with the Chairman, the name of Mr John Speir, Newton, Glasgow, had been sent in as the Society's representative on the Provisional Council. This nomination was approved.

Another communication from the Board of Agriculture was submitted, intimating that a further meeting of the principal Associations concerned in the Dairy Industry would be held in the City Chambers, Glasgow, on Friday, the 14th November, at which representatives of the Society were invited to attend. The following were nominated to attend the Meeting, as representing the Society: Mr W. P. Gilmour, Lieut.-Colonel W. T. R. Houldsworth, Mr John M'Caig, Mr Alexander Murdoch, Mr John Speir, and Sir Hugh Shaw Stewart, Bart.

Rejection of Clydesdale Stallion for Unsoundness.

A letter was submitted from the Royal Agricultural Society of Victoria, with regard to the rejection for unsoundness, by the Government of the State of Victoria, Australia, of a Clydesdale Stallion imported from this country by Captain A. E. T. Payne. The letter was accompanied by a printed statement of the proceedings in connection with the case.

The CHAIRMAN pointed out that this matter was at present occupying the attention of the Clydesdale Horse Society and the Board of Agriculture, and he suggested that it might be left to these bodies to deal with it. This was agreed to.

Weighing of Store Cattle.

A communication was submitted from the Morayshire Farmer Club, dated 21st October, with regard to a movement to render compulsory the weighing of all Store Cattle exposed at Auction Marts. It was agreed that the matter be remitted to the following Committee for consideration and report: Mr J. T. M'Laren (*Convener*), Mr Thomas Elder, Mr William Elliot, Mr John M'Caig, Mr James M'Laren, Mr James M'Queen, and Mr G. Bertram Shields.

Tuberculin Test.

Letters were submitted from Mr J. D. Pottie, M.R.C.V.S., Greenock, suggesting that a Veterinary Surgeon, or Veterinary Surgeons, be present at the testing with tuberculin of all cattle exported to the Argentine, on behalf of the Exporters, or alternatively that the Argentine Government supply the tuberculin for the test, and accept British Veterinary Surgeons' Certificates for cattle that have successfully passed the test in the British Isles within a specified time of their being exported.

Mr FALCONER L. WALLACE of Candacraig and Balcairn expressed disapproval of the proposal, pointing out that it was impossible to interfere with the Argentine Government in a matter of this kind. He moved that no action be taken, and this was agreed to.

MEETING OF DIRECTORS, 3RD DECEMBER 1924.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—*Vice-President*—Sir Robert King Stewart. *Ordinary Directors*—Mr Harry Armour; Colonel F. J. Carruthers; Mr Thomas Elder; The Earl of Elgin and Kincardine, C.M.G.; Mr John Elliot; Mr William Elliot; Alexander Forbes; Mr A. P. Gordon; Mr James Gray; Lieut.-Col. W. T. R. Houldsworth; Mr J. E. Kerr; Mr William Low; Mr John M'Caig; Mr Duncan M'Laren; Mr Robert Macmillan; Mr Alexander Murdoch; Mr Alexander Robertson; Major R. W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr A. A. Hagart Speirs; Major Mark Sprot; Mr Falconer L. Wallace; Mr George Will. *Extraordinary Directors*—Mr N. H. Constable; Mr James Durno; Mr James Gardner; Mr W. P. Gilmour; Mr James Grieve; Mr James A. Hunter; Mr James R. Lumsden; Mr James M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Mr A. W. Montgomerie; Sir Thomas Paxton, Bart., LL.D.; Mr John Speir. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Sir Hugh Shaw Stewart, Bart., C.B. *Consulting Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

Letters.

The following letters were submitted:—

The late Andrew B. Leitch.—From Mrs Leitch and family, returning thanks for resolution of sympathy.

The late E. Hedley Smith.—From Mr A. Davidson Smith, conveying thanks for resolution of sympathy.

Ayrshire Cattle Herd-Book Society.—Expressing thanks for Society's congratulations on the success of Ayrshire Cattle at the London Dairy Show.

"Grass Sickness" Investigation.—From Sir Stewart Stockman, intimating that money for field experiments in "Grass Sickness" had been obtained, through the generosity of a member of that Board, and that, as a result, he did not think there would be any trouble in getting from the Ministry of Agriculture a further special grant for the investigation.

Conference on Agricultural Policy.

A letter was submitted, dated 1st December, from the Board of Agriculture for Scotland, stating that His Majesty's Government had decided to convene a Conference of Agricultural Interests in Scotland, the objects of which were set out in a Memorandum which accompanied the letter. The proposed terms of reference to the Conference were as follows: "To consider what measures, if any, are necessary, either by the State or by the Agricultural Industry itself, or by both in concert, (1) to maintain, and (2) to increase the area of arable land in Scotland, and by what further measures the economic maximum production of food from all the agricultural land of the country can be stimulated."

The Board of Agriculture, acting with the approval of the Secretary for Scotland, invited the Society to submit as early as practicable, for the consideration of Sir John Gilmour in appointing the members of the Conference, the names of two tenant-farmers who were members of the Society.

The CHAIRMAN said that this letter had been before the Finance and Law Committee that morning, and the Committee suggested that the names of Mr John McCaig of Belmont, Stranraer, and Mr James Elder, Athelstanford Mains, Drem, be submitted. This suggestion was unanimously approved.

Vacancies on Board.

On behalf of the Ordinary Directors in the Edinburgh Show Division, Mr G. BERTRAM SHIELDS moved, and Mr HARRY ARMOUR seconded, that Dr Thomas G. Nasmyth, Canaan Lodge, 43 Canaan Lane, Edinburgh, be nominated as an Ordinary Director, to fill the vacancy caused by the death of the late Sir John A. Hope, Bart. This was unanimously agreed to.

On behalf of the Ordinary Directors in the Inverness Show Division, Mr ALEXANDER P. GORDON moved, and Mr JAMES DUBNO seconded, that Mr Peter Grant, The Hotel, Carr Bridge, be nominated as an Ordinary Director, to fill the vacancy caused by the death of the late Mr Andrew B. Leitch. This also was unanimously agreed to.

Glasgow Show, 1925.

Prize List.—A Report of the Shows Committee of 4th November, which had been printed and circulated, was submitted.

The following were the principal suggested alterations in the Prize List :—

Hunters.—That, in accordance with a recommendation of a Sub-Committee, seven Classes be provided, with a total prize-money of £169, of which sum £50 will be contributed by persons interested.

Harness Classes.—The Committee had remitted to Mr J. E. Kerr and Mr Alexander Murdoch to suggest an extended classification for Harness Horses. These gentlemen submitted a suggested classification, embracing seven Classes, with a total prize-money of £218 and a Champion Challenge Cup, value £50. Of this sum £118 will be contributed by the Society, and £100 and the Champion Challenge Cup by persons interested.

Draught Geldings in Harness.—In accordance with a remit by the Committee, Mr JOHN M'CAIG and Mr ALEXANDER MURDOCH suggested an additional Class for Draught Geldings in Harness, with prize-money amounting to £51.

Blackface Sheep.—That the Special Class for Tups to be judged by Judge of Wool be deleted, and a Class substituted for Tup Lambs.

Cheviot Sheep.—That a Class for Tup Lambs be added.

Large White Ulster Pigs.—On a request from the Breed Society, it was agreed to recommend that four Classes be provided for Large White Ulster Pigs, with a total prize-money of £48, of which £20 will be contributed by the Breed Society.

Classes Deleted.—That the Classes provided last year for Dorset Horn Sheep, Gloucestershire Old Spots Pigs, and Bee Appliances be deleted.

The Earl of Elgin and Kincardine pointed out that the small entry of Dorset Horn Sheep at Perth Show was due to the fact that, on account of foot-and-mouth disease restrictions, English Breeders were unable to exhibit. He moved that Classes for Dorset Horns be again provided next year, and this was agreed to.

With this emendation, the Report of the Shows Committee was adopted.

A further Minute of Meeting of Shows Committee, dated 3rd December, was submitted and approved.

The Minute recommended that a free stand be granted to the Scottish National Association of Pig Breeders for an exhibit of Bacon Pigs, together with a sum of £25 towards the cost of the Exhibition.

Convener of Local Committee.—On the Motion of Mr ALEXANDER MURDOCH, Sir Thomas Paxton, Bart., LL.D., was unanimously appointed Convener of the Local Committee of Management.

Appointment of Judges.—The Secretary reported that, at a Meeting of the Board in Committee, on 2nd December, Judges had been appointed for the various Classes of Stock. These were being communicated with, and, after replies were received, the List of Judges would be published in the Press.

Special Prizes.—The following Special Prizes were accepted, and votes of thanks accorded to the donors :—

- (1) *British Friesian Cattle Society*—£54 towards the prizes in the British Friesian Classes, together with two Champion Prizes of £5 each for the best Bull and for the best Female exhibited.
- (2) *The Dun and Belled Galloway Cattle-Breeders' Association*—Half the prize-money in Belted Galloway Classes.
- (3) *The Hunters' Improvement, &c., Society*—Champion Gold Medal for the best Hunter Filly (not exceeding 3 years old), on same conditions as at Perth.

- (4) *The National Pony Society and Highland Pony Society*—Two Special Prizes of £10 each for the best Highland and best Western Island Ponies, on same conditions as at Perth.
- (5) *Large White Ulster Pig Society*—£20 towards the prizes for Large White Ulster Pigs.

Forestry Examinations.

A Minute of Meeting of Forestry Committee, dated 2nd December, was read and approved.

The Minute stated that, in accordance with the remit from the Board on 6th June 1923, the Forestry Committee had considered the proposed new Syllabus for the Society's First and Second Class Certificates in Forestry, as revised by a Sub-Committee of the Education Committee. The part of the Syllabus relating to Practical Forestry had been adjusted, but that relating to Forest Botany, Zoology, and Engineering had been remitted to Sub-Committees for further consideration.

Grants to Local Societies.

A Report by the Shows Committee, dated 3rd December, relating to Grants to Local Societies, was submitted and approved.

The Committee recommended twenty-one districts for grants of £12 each; eight districts for three Silver Medals each; nine districts for grants of £15 each for Stallions; special grants of £15 to the Northern Arts and Crafts Society; £60 for Federations of Women's Rural Institutes; £20 to Kilmarnock Cheese Show; £3 to Orkney; £3 to Sanday, Orkney; £3 to East Mainland, Orkney; £3 to West Mainland, Orkney; £3 to Walls and Hoy Agricultural Society; and £3 to Kilmuir (Skye) Show Committee; a Gold Medal and a Silver Medal to the British Dairymaids' Association; nineteen districts for two Medals each; the usual Medals at Ploughing and Hoeing Competitions; and three districts for two Medals each for Cottages and Gardens; Long Service Medals and Certificates, say £102, 10s.—making the total sum offered in 1925 £772, 11s., against £700, 8s. 9d. awarded in 1924.

A Minute of Meeting of Shows Committee, dated 3rd December, was submitted and approved.

The Minute recommended that the Annual Value of Cottages eligible to compete for the Society's Medals for Cottages and Gardens be increased from £15 to £20.

Studs on Traction Engine Wheels.

The SECRETARY reported that a letter had been received, dated 6th November, from the Ministry of Transport, inviting the Society to send two representatives to a Conference to be held on 28th November, with regard to the question of the desirability of repealing the Locomotives on Highways (Construction of Wheels) (Scotland) Order, 1917, which permitted the use of studs on traction engine wheels under certain conditions. The Conference was to be presided over by Sir Henry Maybury, Director-General of Roads. After consultation with the Chairman of Directors, it was arranged that the Society should be represented at the Conference by the Chairman and Colonel F. J. Carruthers of Dormont, Lockerbie.

Colonel CARRUTHERS submitted a Report on the proceedings at the Conference.

The Report, after giving details of the proceedings, stated that it was unanimously agreed not to oppose the repeal of the Order, Sir Henry Maybury undertaking to take steps to protect the interests of farmers by informing the various Road Authorities that special permission to use studs on frost and snow-bound roads should not be unreasonably withheld.

On the Motion of the CHAIRMAN, Colonel Carruthers was thanked for attending the Conference and for his Report.

International Dairy Congress.

A letter was submitted, dated 25th November, from the Board of Agriculture for Scotland, with regard to a proposal to hold an International Dairy Congress in 1926 or 1927. As a preliminary step, a Conference of representatives of all sides of the Milk Industry would be called to ascertain their attitude towards the suggestion, but, in the meantime, the views of the Society were invited with regard to the proposed Congress, and as to the desirability of holding a preliminary Conference, as before mentioned.

While it was felt that the Directors had not sufficient information to enable them to express any view with regard to the desirability of holding an International Dairy Congress, they agreed to appoint Mr John Speir, Newton Farm, Hallsido, Glasgow, to represent the Society at any Conference of Scottish Representatives which may be called to discuss the matter.

MEETING OF DIRECTORS, 7TH JANUARY 1925.

Mr J. T. M'LAREN, The Louchold, Dalmeny, in the Chair.

Present.—Ordinary Directors—Mr Harry Armour; Colonel F. J. Carruthers; Mr Thomas Elder; The Earl of Elgin and Kincardine, C.M.G.; Mr William Elliot; Mr A. P. Gordon; Mr James Gray; Lieut.-Col. W. T. R. Houldsworth; Mr J. E. Kerr; Mr William Low; Mr John M'Caig; Captain John MacGillivray; Mr Duncan M'Laren; Mr Alexander Murdoch; Mr Alexander Robertson; Major R. W. Sharpe; Mr G. Bertram Shields; Major Mark Sprot; Mr John Stewart; Mr George Will. *Extraordinary Directors*—Mr Thomas A. Buttar; Mr N. H. Constable; Mr James Gardner; Mr W. P. Gilmour; Mr James Grieve; Bailie George Kerr; Mr James R. Lumsden; Mr James M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Sir Thomas Paxton, Bart., LL.D.; Mr John Speir. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Sir Hugh Shaw Stewart, Bart., C.B. *Auditor*—Mr William Home Cook, C.A. *Consulting Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

The late Professor A. N. M'Alpine.

Before proceeding with the business of the Meeting, the CHAIRMAN referred in sympathetic terms to the death of Professor A. N. M'Alpine, who, as Consulting Botanist, had been a trusted and valued official of the Society for the long period of forty years. He did not propose, he said, to refer to Professor M'Alpine's many services to Agriculture as an official of the West of Scotland Agricultural College, but he could say that his was an arresting personality, and that he retained the regard of all with whom he came in contact. He submitted a resolution expressing the deep regret with which the Directors learned of Professor M'Alpine's death, and their sense of the valuable services which he had rendered to the Society. The resolution was duly approved, the members present upstanding, and the Secretary was instructed to send a copy thereof to the widow and family of the deceased.

Finance.

A Minute of Meeting of Committee, dated 7th January, was read and approved. The Minute stated (1) that an Abstract of the Accounts for the year 1923-24, as prepared by the Society's Auditor, had been submitted and approved, and signed by two members of the Finance Committee and by the Auditor; and (2) that the usual Estimate of probable Income and Expenditure for the year 1924-25, as prepared by the Secretary, had been submitted.

Glasgow Show, 1925.

Stewards.—The Stewards of the various departments were appointed as follows: *Cattle*—Mr J. Ernest Kerr and Mr W. P. Gilmour; *Horses*—Mr John M'Caig and Mr John P. Sleigh; with Colonel F. J. Carruthers and Mr Alexander Murdoch as additional Stewards; *Sheep, Goats, Pigs, and Wool*—Mr R. Macmillan and Mr Duncan M'Laren; *Grand Stands*—Mr Thomas Kirk and Mr James M'Queen; *Forage*—Mr James M'Laren and Mr John Stewart; *Gates*—Mr Alexander Forbes and Mr William S. Niven; *Implements*—Mr G. Bertram Shields and Mr John Speir; *Poultry*—Mr James R. Lumsden; *Catering and Honey, &c.*—Major Mark Sprot.

Veterinary Surgeon.—Professor John R. M'Call, M.R.C.V.S., 331 Byres Road, Glasgow, was unanimously appointed Veterinary Inspector for the Glasgow Show, on the usual conditions.

Riding Classes for Children.—On the suggestion of Mr JOHN SPIER it was agreed, subject to consideration by the Stewards as to time of judging and parades, that two classes be provided for Children's Riding Ponies—one for Ponies under 14 hands to be ridden by boys or girls over 10 and under 14 years of age, and the other for Ponies under 10 hands to be ridden by boys or girls 10 years of age and under.

Hospitality to Foreign Visitors.—Captain JOHN MACGILLIVRAY of Calrossie suggested that there be an annexe to the Directors' luncheon room in the showyard, where hospitality might be extended to visitors from overseas. They had always a number of breeders and leading agriculturists from America and the Colonies at the Show, and he thought there should be some place where such visitors could be accommodated and entertained, and that a Steward be appointed to look after this department.

The CHAIRMAN said he was sure the matter would not be lost sight of. He suggested that it be remitted to the Shows Committee for consideration and report, and this was agreed to.

Middle White Pigs.—On a representation from the National Pig-Breeders' Association, it was agreed to provide an extra Class in the Middle White Pig Section, giving five Classes instead of four.

Forestry Exhibition.—An application was submitted from the Royal Scottish Arboricultural Society for an increased grant to provide prizes in the Forestry Section at the Show. On the motion of Sir HUGH SHAW STEWART, Bart., seconded by the EARL of ELGIN, it was agreed to increase the grant from £20 to £40 for the current year.

Fur-Bearing Rabbits.—A letter was submitted from Mr W. N. Ramsay, Honorary Secretary of the Committee of a proposed Scottish Fur-Breeders' Association, making application for a Section for the exhibition of Fur-Bearing Rabbits. In a further letter, it was suggested that the classification should embrace ten Classes, with an entry fee of 2s. 6d., and prize-money of 15s., 10s., and 5s. in each Class, or a total prize-money of £16.

The EARL of ELGIN and KINCARDINE moved, and Captain JOHN MACGILLIVRAY seconded, that the suggested Classes be provided, on condition that the proposed Scottish Fur-Breeders' Association provide half the prize-money, amounting to £7, 10s.

Mr WILLIAM LOW of Balmakowan moved, and Sir THOMAS PAXTON, Bart., seconded, that no action be taken.

On a division, the motion was carried by a large majority, and it was accordingly decided that Classes be provided, on condition that the Association referred to contribute £7, 10s., being one-half of the prize-money.

Special Prizes.—The following Special Prizes were accepted, and votes of thanks accorded to the donors :—

(1) *Shorthorn Society*—

(a) Two Champion Prizes of £20 each, with Silver Medals to the breeders, for the best Male and best Female Shorthorn.

(b) Two prizes of £10 each, for best Dairy Shorthorn Cow, and best Dairy Shorthorn Heifer, with Silver Medals to the breeders.

(2) *Dairy Shorthorn Association*—A First Prize of £10, and a Second Prize of £5, for a Special Class for Pedigree Dairy Shorthorn Bulls, born in 1924, entered or their Pedigrees accepted for entry in Coates's Herd-Book.

(3) *Ayrshire Cattle Herd-Book Society*—

(a) £20 to provide two prizes of £10 each for the best Male and Female respectively of the Ayrshire Breed, entered with a number in the Herd-Book not later than 1st June 1925.

(b) Cowhill Champion Cup, approximate value £30, for best animal of the Ayrshire Breed, entered with a number in the Herd-Book.

(4) *The Clydesdale Horse Society*—Cawdor Challenge Cup for the best Clydesdale Mare or Filly, on the same conditions as formerly.

(5) *Board of Agriculture for Scotland*—£40 towards the prizes in the Highland Pony Classes, and £12 towards prizes for Goats.

(6) *The Shetland Pony Stud-Book Society*—Silver Medal for the best Shetland Pony, on the same conditions as formerly.

(7) *Suffolk Sheep Society*—£25 in prizes as follows : Suffolk Ram Lamb, £10 ; three Suffolk Ewe Lambs, £8, £5, and £2, as at L'orth.

(8) *National Pig-Breeders' Association*—(a) Gold Medal for the best Large White Boar, and Gold Medal for the best Large White Sow ; (b) Gold Medal for the best Middle White Boar, and Gold Medal for the best Middle White Sow.

Implements.

A Minute of Meeting of Implements Committee, dated 7th January, was submitted and approved.

The Minute stated that the Committee had considered an application from Mr Andrew M'Dowall, Bankvale, Dundrennan, by Castle-Douglas, for a grant to meet the cost of building an Electric Tractor, on the lines of an experimental machine which he had constructed. After careful deliberation, it was decided, with regret, to recommend that a reply be sent that the Directors could not see their way to authorise a grant for this object.

Weighing of Store Cattle.

A Minute of Meeting of Special Committee on Weighing of Store Cattle was submitted and approved.

The Minute stated that it was desirable that the Committee should be added to so as to give a wider representation from different parts of the country, and suggested the addition of the following names—Mr Harry Armour, Mr T. A. Buttar, Mr James Durno, Mr Duncan M'Laren, Mr W. S. Nivon, Mr John P. Sleigh, and Mr John Stewart.

Proposed Standard Table of Unexhausted Values.

The SECRETARY reported that a letter had been received from the Board of Agriculture for Scotland, dated 22nd December, inviting the Society to nominate a representative to attend a Conference in London on 8th January. The object of the Conference was to consider the findings of a Scientific Committee which was appointed in 1923 to revise the existing Scales, or to draw up new ones, for the Valuation of Unexhausted Manurial Values of Feeding-Stuffs and Fertilisers.

The Secretary reminded the Directors that, at a Meeting on 7th February 1923, it was agreed that the Directors approve generally of the proposal to issue such a Standard Table, and the Board of Agriculture was informed that the Society was prepared to co-operate in its preparation. In view of that decision, and in view of the early date of the proposed Conference, he had consulted the Chairman of Directors, Mr J. T. M'Laren, who had been good enough to agree to act as the Society's representative at the Conference, and this had been duly intimated to the Board of Agriculture.

Mr M'Laren's appointment was duly confirmed.

Show of 1927.

Mr J. T. M'LAREN, Chairman of Directors, moved: "That, provided a suitable site is available, and satisfactory financial and other arrangements can be made, the Society's Show of 1927 be held in the Edinburgh Show Division."

The motion was seconded by Mr DUNCAN M'LAREN, Fairnington, and unanimously agreed to.

New Members.

The SECRETARY intimated that there were 274 candidates for election as Members of the Society at the Anniversary General Meeting to be held that afternoon.

Finance.

A Minute of Meeting of Finance Committee, dated 7th January, was submitted and approved.

The Minute recommended, following on the Report of a Sub-Committee, that the conditions governing privileges in respect of Analyses for Members be amended as follows:—

- (1) Veterinary Surgeons shall not be entitled to have searches made for poisons in food or viscera, at the reduced rate, for clients who are not Members of the Society.
- (2) Not more than six samples of Milk per annum shall be analysed, at the reduced rate, for any one member.

MEETING OF DIRECTORS, 4TH FEBRUARY 1925.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—Ordinary Directors—Mr Harry Armour; Colonel F. J. Carruthers; Mr Thomas Elder; The Earl of Elgin and Kincardine, C.M.G.; Mr John Elliot; Mr Thomas Elliot; Mr William Elliot; Mr William Low; Mr Duncan M'Laren; Mr Alexander Murdoch; Dr Thomas G. Nasmyth; Mr William S. Niven; Mr James Rodger; Major R. W. Sharpe; Mr G. Bertram Shields; Mr John P. Sleigh; Mr A. A. Hagart Speirs; Major Mark Sprot; Mr John Stewart. *Extraordinary Directors*—Mr Thomas A. Buttar; Mr N. H. Constable; Mr James Durno; Mr James Gardner; Mr W. P. Gilmour; Mr James Grieve; Bailie George Kerr; Mr James R. Lumsden; Mr James M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Sir Thomas Paxton, Bart., LL.D.; Major James Kemp Smith; Mr John Speir; Mr Duncan M. Wallace. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Sir Hugh Shaw Stewart, Bart., C.B. *Consulting Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

Letters.

Royal Scottish Arboricultural Society.—Thanks for increased grant for prizes for timber.

Glasgow Veterinary College.—Letter from Secretary forwarding copies of Statement prepared for the Governors by Professor Glaister with regard to the maintenance of the College as a Teaching Institution.

Science.

A Minute of Meeting of Committee, dated 4th February, was submitted and approved.

The Minute dealt with the following matters:—

Schedule of Unit Values.—The Schedule of Unit Prices of Manures and Feeding-Staffs for the current year had been revised, and it was recommended that it be printed and issued as usual.

Values of Unexhausted Manures and Feeding-Staffs.—It was recommended that the Table of Values of Unexhausted Manures and Feeding-Staffs be reissued, and that it be remitted to Dr Tocher, Consulting Chemist, to revise it in terms of the new Unit Values.

Glasgow Show, 1925.

A Minute of Meeting of Shows Committee, dated 4th February, was submitted and approved.

The Minute dealt with the following matters:—

Regulations.—It was recommended that in Rule 1 the words "United Kingdom" be altered to "Great Britain, Northern Ireland, and Irish Free State."

Rabbit Section.—The Secretary reported that the new Scottish Fur-Breeders' Association had agreed to contribute half the prize-money in the Rabbit Section, amounting to £7, 10s. It was remitted to the following Sub-Committee to deal with all details of the arrangements for the Rabbit Section—The Earl of Elgin and Kincardine, Mr J. Ernest Kerr, and Major Mark Sprot.

Horse-Shoeing Competition.—It was remitted to the following Sub-Committee to consider the whole question of holding a Horse-Shoeing Competition, and report to next Meeting—Mr John Speir, Mr Alexander Murdoch, and Mr James Gardner.

Timber for Showyard.—A Minute of Meeting of Show Contracts Committee, dated 3rd February, was read and approved.

The Minute stated that three tenders for the hire of timber had been received. The lowest tender was from Messrs Bell & Sime, Ltd., Dundee, the amount being £1900, and it was decided that this tender be accepted.

Special Prizes—

Oxford-Down Sheep-Breeders' Association.—(a) £21 towards the prizes in the Oxford-Down Sheep Classes; (b) Scottish Oxford-Down Sheep-Breeders' Challenge Cup, value £50, for the best Oxford-Down animal bred in Scotland, on same conditions as formerly.

Dorset Horn Sheep-Breeders' Association.—£5 towards the prizes in the Dorset Horn Sheep Classes.

The Earl of Elgin and Kincardine, C.M.G.—£10 towards the prizes in the Dorset Horn Sheep Classes.

Edinburgh Show, 1927.

The following Committee was appointed to look out for a suitable site in the Edinburgh Show Division for the Show of 1927, and report to the Board :— Mr J. T. M'Laren (*Convener*), Mr Harry Armour, Colonel F. J. Carruthers, Mr Thomas Elder, The Earl of Elgin and Kincardine, Mr John Elliot, Mr Alexander Forbes, Mr J. Ernest Kerr, Captain John MacGillivray, Mr Alexander Murdoch, Dr T. G. Naamyth, Mr G. Bertram Shields, Sir Hugh Shaw Stewart, Bart., and Sir David Wilson, Bart.

Weighing of Store Cattle.

A Minute of Meeting of Special Committee, dated 4th February, was submitted.

The Minute stated that the Committee had considered the communication from the Morayshire Farmer Club, dated 21st October 1924, in which the Society was invited to support a Petition that the weighing of Store Cattle before entering the ring at Auction Marts be made compulsory. The Committee decided, by six votes to five, to recommend that the Society support the action of the Morayshire Farmer Club, with the reservation that any compulsory order passed should not apply to breeding or dairy stock, or to animals under the age of nine months.

The Chairman, Mr J. T. M'LAREN, moved the adoption of the Minute, and this was seconded by Mr THOMAS ELDER of Stevenson, Haddington.

Mr WILLIAM ELLIOT, Lanark, seconded by Mr JAMES GARDNER, South Hillington, moved, as an Amendment, that the Minute be not adopted.

After discussion a vote was taken, when 17 voted for the Amendment, and 11 for the Motion. The Minute of the Committee was, therefore, not adopted.

Proposed Standard Scale of Unexhausted Values.

The CHAIRMAN reported that he had attended a Conference in London, on 8th January, with regard to the proposed Standard Scale of Unexhausted Values of Fertilisers and Feeding-Stuffs. A discussion took place on Voelcker and Hall's Tables, but nothing definite was arrived at, as there was a good deal of difference of opinion amongst the chemical experts. Those experts were eventually asked to reconsider the matter and bring up a Report, which would be submitted to a small Sub-Committee, and thereafter the Conference would again be called together.

Border Show, 1926.

The Meeting considered the proceedings at the Anniversary General Meeting on 7th January, with regard to the decision of the Directors that the Show of 1926 be held at Peebles.

A letter was read from the Town Clerk of Kelso, forwarding copies of two letters to him from Mr William Whitelaw, Chairman of the London and North Eastern Railway Company. In these letters Mr Whitelaw pointed out that if the Society decided to hold the Show of 1926 at Kelso, the Directors of the Railway Company would then decide what they were prepared to do to increase the railway facilities there.

After very full discussion, it was eventually decided that a letter, of which a draft was submitted, be sent to the Town Clerk of Kelso, as Secretary of the Kelso Committee, pointing out that the Directors were prepared to give further consideration to the question of the site of the 1926 Show, but that it was obvious they could not reach any conclusion other than that already arrived at, unless some new facts arose which materially affected the situation. If the Kelso Committee were able to secure from the railway company a definite assurance that, in July 1926, they would have facilities at Kelso whereby the whole of the stock from the Show could be despatched between 6 P.M. on the Friday and 3 A.M. on the Saturday, that would afford sufficient ground for the Directors again taking the whole question into their consideration.

MEETING OF DIRECTORS, 4TH MARCH 1925.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, in the Chair.

Present.—*Ordinary Directors*—Mr Harry Armour; Colonel F. J. Carruthers; Mr Thomas Elder; The Earl of Elgin and Kincardine, C.M.G.; Mr John Elliot; Mr William Elliot; Mr Alexander Forbes; Mr Peter Grant; Lieut.-Col. W. T. R. Houldsworth; Mr J. Ernest Kerr; Mr John M'Caig; Captain John MacGillivray; Mr Duncan M'Laren; Mr Robert Macmillan; Mr Alexander Murdoch; Dr Thomas G. Nasmyth; Mr William S. Niven; Mr James Rodger; Major R. W. Sharpe; Mr G. Bertram Shields; Major Mark Sprot; Mr John Stewart. *Extraordinary Directors*—Mr Thomas A. Buttar; Mr N. H. Constable; Mr James Durno; Mr James Grieve; Mr James M'Laren; Mr J. T. M'Laren; Mr James M'Queen; Mr A. W. Montgomerie; Mr Robert G. Murray; Major James Kemp Smith; Mr Duncan M. Wallace. *Treasurer*—Sir David Wilson, Bart., D.Sc. *Hon. Secretary*—Sir Hugh Shaw Stewart, Bart., C.B. *Consulting Chemist*—Dr J. F. Tocher. *Consulting Engineer*—Professor R. Stanfield.

The late Mr Thomas Kirk of Abbeymains.

The CHAIRMAN said the Directors had again to record the loss of a valued colleague. Since last Meeting of the Board Mr Thomas Kirk of Abbeymains had been removed by death. For several years he had rendered valuable service to the Society as a Director, and also as the Society's representative on the Board of Governors of the Royal (Dick) Veterinary College. He took an active part in public affairs, and was well known as a breeder of Shorthorn cattle. In all his activities he retained a charm of manner which gained him many friends.

A resolution of regret and sympathy was read and adopted, the members present upstanding, and the Secretary was instructed to forward a copy thereof to the widow of the deceased.

Letters.

Mrs M'Alpine, Glasgow.—Thanks for Minute of sympathy on the death of her husband, the late Professor A. N. M'Alpine.

Scottish National Association of Pig Breeders.—Letter from Secretary expressing thanks for grant and free stand.

Geological Society of London.—Letter intimating that the Director-General of H.M. Ordnance Survey had decided to resume publication of the 6-inch Ordnance Survey maps in quarter sheets, and thanking the Directors for their support in this matter.

Glasgow Show, 1925.

Proof of Prize List.—A proof print of the Prize List and Regulations was submitted and approved for publication.

Shows Committee.—A Minute of Meeting of Shows Committee, dated 4th March, was submitted.

The Minute dealt with the following matters:—

Hospitality to Overseas Visitors.—The Committee considered the remit from the Board at the January Meeting, and Captain JOHN MACGILLIVRAY moved that the Directors adopt the principle of entertaining overseas visitors at the Show, to the extent of providing additional accommodation in the Directors' luncheon room where such visitors could be entertained to luncheon, &c., by individual Directors at their own expense. The Motion was, however, defeated, the previous question being carried by 20 votes to 7 for the Motion.

Horse-Shoeing Competition.—On the recommendation of a Sub-Committee it was decided to recommend that a Horse-Shoeing Competition be held, with two classes on similar lines to last year. It was further recommended that the following be invited to act as Judges, along with the Society's Veterinary Inspector: Mr Thomas B. Begg, Blacksmith, Parkhall House, East Kilbride, and Mr William Johnston, Blacksmiths, Pitscottie, Cupar-Fife. The following were also nominated to act as a Committee of Management of the Competition: *Highland and Agricultural Society*—Mr George Will, Crichton Royal, Dumfries; Mr James Gardner, South Hillington, Cardonald; and Mr N. H. Constable, Bute

Estate Office, Rothessay. *Farriers' and Blacksmiths' Association*—Mr George G. M'Diarmid, 17 Cross Arthurlie Street, Barrhead; Mr Alexander Chalmers, 388 Paisley Road, Glasgow; Mr Robert Orr, of Messrs Orr & Fraser, Marr Street, Govan.

Ayrshire Milk Records.—It was recommended that in future the actual yield of Ayrshire Cows and Heifers be entered in the Catalogue, without reducing these to a 3·8 per cent butter fat standard. The information given to the judges would be these records reduced to a uniform standard of 3·8 per cent butter fat, and not as at present reduced to a 1 per cent standard of butter fat.

Shetland Ponies in Saddle.—It was recommended that the special class for Shetland Ponies in Saddle be judged by the Hunter Judge or Judges.

Glasgow Agricultural Society.—It was agreed to grant the Glasgow Agricultural Society a free stand, with 20 feet of frontage, for the use of its members.

On the Motion of Mr JOHN ELLIOT, Vice-Convener, the Minute of Shows Committee was adopted.

The CHAIRMAN said he desired to add a word as to the entertainment of visitors. He would not like it to go forth that the Board of Directors were unwilling, or had in the past been unwilling, to extend hospitality to strangers who visited the Show. The practice had been to leave this matter to the discretion of the Chairman for the time being, and there was no intention to depart from that well-established custom.

Times of Judging and Parades.—A Minute of Meeting of Stewards of Stock and Parades, dated 4th March, was submitted and approved.

The Minute recommended that the forenoon parades of Cattle be abolished; that the judging of Horses in Harness begin on the Tuesday afternoon, and be continued during Wednesday and Thursday; that the Draught Geldings in Harness be judged on Thursday forenoon, and paraded on Thursday afternoon; and that the Children's Riding Ponies be judged on Wednesday afternoon, and paraded on Thursday.

Catering.—A Minute of Meeting of Catering Committee, dated 4th March, was submitted.

The Minute recommended that there be four licensed catering stands in the Showyard, these to be in the hands of the following caterers: Mr John Mitchell, Royal Athenaeum, Aberdeen; Messrs Alexander Fairley & Son, 83 Leith Street, Edinburgh; Messrs William & R. S. Kerr (Glasgow) Ltd., Baker Street, Shawlands Cross, Glasgow; and Mr Albert Dauthieu, Banavie Hotel, Banavie. The tea stand would again be in the hands of Mr John Henderson, Aberdeen. The British Women's Temperance Association would, as usual, have an unlicensed refreshment stand.

The SECRETARY reported that the headquarters of the Society during the Show would be at the Central Station Hotel, Glasgow.

Mr WILLIAM ELLIOT, Lanark, drew attention to the desirability of sufficient provision being made for the serving of teas, sandwiches, and other light refreshments, at a moderate rate.

The CHAIRMAN stated that the Directors were in entire sympathy with Mr Elliot's suggestion, and every effort would be made to meet this requirement.

On the Motion of Major MARK SPROT, Convener, the Minute was then adopted.

New Implements.—The following were appointed judges of new implements entered for the Society's Silver Medal: Mr G. Bertram Shields, Dolphingstone; Mr John Speir, Newton; and Mr Thomas A. Buttar, Corston.

Proposed International Dairy Congress.

Letters were submitted from the Board of Agriculture for Scotland with regard to a proposal to hold an International Dairy Congress at Reading in 1926. The Board had decided to call a Meeting, representative of the Scottish Dairy Industry, on Friday, 13th March, so that the opinions of the different interests might be expressed, and a Committee appointed to co-operate with the Central Committee in London, in order to secure that the various branches of the industry in Scotland may have a satisfactory place in the Congress.

It was decided to appoint Mr John M'Craig of Belmont, Stranraer, and Mr W. P. Gilmour, Balmangan, Kirkcudbright, as the Society's representatives at the proposed Meeting.

Border Show, 1926.

A letter was submitted from the Town Clerk of Kelso, forwarding Memorandum of a Meeting held between the Kelso Committee and Major C. H. Stomp and

other representatives of the London and North Eastern Railway Company. From this Memorandum it appeared that the Railway Company were now prepared to provide, if it were decided to hold the Show at Kelso in 1926, a loading bank, on the down side of the line to the west of Kelso Station, as was done in 1898. With this provision, while Major Stemp could give no guarantee whatever, he was of opinion, taking the estimated figure of 400 vehicles as a guide, that the last special with live stock would be got away by 6 a.m. approximately on the Saturday following the Show.

The SECRETARY further reported that he had been in communication with Mr Hugh N. Mitchell, Kingsmeadows, Peebles, and read a letter from Mr Mitchell, dated 19th February, withdrawing the offer of Kingsmeadows Park as a site for the Show of 1926.

After discussion it was agreed to remit to the Chairman, the Consulting Engineer, and the Secretary, to make further inquiries as to the obtaining of a suitable access to the proposed new loading bank, and also as to accommodation for parking motor cars, and to report to next Meeting of the Board.

The CHAIRMAN gave notice, in terms of the Standing Orders, that he would move at next Meeting of the Board, that the decision arrived at by the Board of Directors on 5th November 1924, that the Annual Show of 1926 be held at Peebles, be rescinded.

PROCEEDINGS AT GENERAL MEETINGS.

GENERAL MEETING, 4TH JUNE 1924.

Sir RALPH ANSTRUTHER of Balcaskie, Bart., Vice-President, in the Chair.

New Members.

Two hundred and sixty-seven candidates were balloted for and admitted Members of the Society.

Election of Office-Bearers.

The Secretary submitted the following list of office-bearers for the year 1924-25, as recommended by the Board of Directors:—

President.—The Lord Blythwood, K.C.V.O., Blythwood, Renfrew.

Vice-Presidents.—The Marquis of Ailsa, Culzean Castle, Maybole; The Marquis of Graham, C.B., Brodick Castle, Isle of Arran; Sir Robert King Stewart of Murdostoun, Newmains; the Right Hon. Matthew Walker Montgomery, Lord Provost of the City of Glasgow, City Chambers, Glasgow.

Ordinary Directors, 1921.—Lieut.-Colonel W. T. R. Houldsworth of Kirkbride, Maybole; Major Mark Sprot of Riddell, Lilliesleaf; Mr John P. Sleight of St John's Wells, Fyvie; Mr Alexander Robertson, Estate Office, Polmaise, Stirling; Mr George Will, Crichton Royal Institution, Dumfries; Mr Andrew B. Leitch, Inchstelly, Alves, Forres; The Duke of Atholl, K.T., C.B., M.V.O., D.S.O., Blair Castle, Blair-Atholl.

1922.—Mr Duncan M'Laren of Fairnington, Roxburgh; Mr G. Bertram Shields, Dolphingstone, Tranent; Mr Falconer L. Wallace of Candacraig and Balcairn, Aberdeenshire (Upper Feilde, Park Street, London, W. 1); Mr James Rodger, Rochdale Lodge, Abercromby Drive, Bridge of Allan; Colonel F. J. Carruthers of Dormont, Lockerbie; Captain John MacGillivray of Calrossie, Nigg, Ross-shire; Mr John Stewart of Struthers, Woodburne House, Ceres, Fife; Mr Alexander Murdoch, East Hallside, Hallside, Glasgow.

1923.—Mr Thomas Elder of Stevenson, Haddington; Mr Alexander Forbes, Rettie, Banff; Mr James Gray, Birkenwood, Kippen Station; Mr John M'Caig of Belmont, Stranraer; Mr Thomas Elliot, Sciberscross, Rogart; The Earl of Elgin and Kincardine, C.M.G., Broomhall, Dunfermline; Mr A. A. Hagart Speirs of Elderslie, Houston House, Houston; Major Robert W. Sharpe of The Park, Earlstoun.

1924.—Mr William Low of Balmakewan, Marykirk, Montrose; Mr J. Ernest Kerr of Harviestoun, Dollar; Mr Robert Macmillan of Holm of Dalquhairn, Woodlea, Moniaive; Mr Alex. P. Gordon of Bindal, Portmahomack; Mr William S. Niven, The Loan, Errol; Mr William Elliot, Muirglen, Lanark; Mr John Elliot, Meigle, Clovenfords; Mr Harry Armour, J.P., Niddry Mains, Winchburgh.

Extraordinary Directors.—Mr W. P. Gilmour, Balmangan, Kirkcudbright; Mr James M'Laren, Cornton, Stirling; Mr Thomas Kirk of Abbey Mains, Haddington; Mr James Durno, Crichtie, Inverurie; Major James Kemp Smith (Messrs Kemp & Nicholson), Stirling; Mr Thomas A. Buttar, Corston, Coupar-Angus; Mr J. T. M'Laren, The Leuchold, Dalmeny House, Edinburgh; Mr James Grieve, Rumble-

tonlaw, Greenlaw; Mr James R. Lumsden of Arden, Dumbartonshire; Mr James M'Queen of Crofts, Dalbeattie; Mr N. H. Constable, Bute Estate Office, Rothesay; Mr James Gardner, South Hillington, Cardonald; Mr James A. Hunter, Machriberg, Campbeltown; Bailie George Kerr, City Chambers, Glasgow; Sir John Maxwell Stirling Maxwell of Pollok, Bart., Pollok House, Pollokshaws; Mr A. W. Montgomerie, Leasnessock, Ochiltree; Mr Robert G. Murray of Spittal, Biggar; Sir Thomas Paxton, Bart., LL.D., 22-28 Adelphi Street, Glasgow, S.S.; Mr John Speir, Newton Farm, Hallside, Glasgow; Mr Duncan M. Wallace, 34 Paton Street, Dennistoun, Glasgow.

Treasurer.—Sir David Wilson, Bart., D.Sc., of Carbeth, Killearn.

Honorary Secretary.—Sir Hugh Shaw Stewart of Greenock and Blackhall, Bart., C.B., Ardgowan, Inverkip.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, Chairman of Directors, in moving approval of the list of office-bearers, made special reference to the recommendation that Sir Hugh Shaw Stewart of Greenock and Blackhall, Bart., be appointed to the office of Honorary Secretary to the Society. The office had become vacant through the lamented death of Dr Charles Douglas. Sir Hugh had rendered valuable services to the Society not only as a Director but as Chairman of the Board. While the other office-bearers would take up office in November, Sir Hugh Shaw Stewart would enter upon his duties as from the date of that Meeting.

The list of office-bearers was unanimously approved.

Sir HUGH SHAW STEWART, in accepting office as Honorary Secretary, thanked the Meeting for the honour that had been conferred on him.

Perth Show, 1924.

Mr THOMAS A. BUTTAR, Corston, Coupar-Angus, Convener of the Shows Committee, reported that satisfactory progress was being made with the arrangements for the Show that year, to be held at Perth on Tuesday, 15th July, and three following days. The town of Perth was co-operating cordially with the Society in every endeavour to secure the success of the Show. In addition to the excellent and convenient site provided on the South Inch, the town had voted a donation of £100 to the Show funds, and, besides giving a supply of water free of charge, was providing facilities for a supply of both gas and electricity.

The total value of the premiums and cups offered reached a sum of £5712. This compared with a sum of £3058 offered at Perth in 1904, and £3210 at Cupar in 1912. All the interesting features of recent Shows were retained, including the Rural Industries Section and Horse-Shoeing Competition, and in the Live Stock department at least one new section had been added—viz., Dorset Horn Sheep. Modifications in the incidence of the Entertainment Tax now permitted of the engagement of a Military Band and Pipers to perform in the Showyard.

Entries of Implements and Machinery were exceptionally large, the amount of shedding taken for these and similar exhibits reaching a total of over 8200 feet of frontage. This represented about 315 individual exhibitors, or 50 per cent more than at each of the two previous Shows in the district. Entries of Stock were also on a gratifying scale. The number of horses showed a substantial increase compared with last year, and there were very large increases in the classes for sheep, pigs, and poultry. Cattle showed a slight decrease from last year, this being no doubt accounted for by uncertainty in the minds of exhibitors as to the effect of foot-and-mouth disease restrictions.

The Show gave promise of being the largest and most interesting ever held in Perth, and, provided no further serious outbreak of foot-and-mouth disease occurred in Scotland, and that good weather favoured the meeting, it should prove to be an unqualified success.

Glasgow Show, 1925.

Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., reported that the arrangements for the Glasgow Show in 1925 were proceeding satisfactorily. As already reported, the Corporation of Glasgow had placed at the disposal of the Society an excellent site for the Show in Bellahouston Park, together with a free supply of water, and had also promised a donation of £525 to the Show funds. The date of the Show had now been fixed for Tuesday, 14th July 1925, and three following days.

Border Show, 1926.

Major R. W. SHARPE of The Park, Earlstoun, reported that a Committee had under consideration four possible sites for the Show of 1926. They had visited these sites, and the various local authorities were prepared to do everything within their power to help the Society. The Committee had not yet arrived at a decision as to the site to be recommended.

Foot-and-Mouth Disease.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, Chairman of Directors, reported as follows :—

"At the Anniversary General Meeting of the Society on 9th January, the following resolution was passed :—

"To remit to the Board of Directors to consider as to whether the offer of a monetary reward by the Highland and Agricultural Society will be of advantage in assisting scientific experts in discovering a method of immunity from foot-and-mouth disease by inoculation or otherwise, and to report to the Society, at the same time dealing with the amount of such reward, if any."

"Following that meeting the Directors gave most careful consideration to the remit, and at their meeting on 5th March unanimously arrived at the decision that, in view of the action recently taken by the Government in appointing a Departmental Committee to investigate the whole subject of foot-and-mouth disease, and the provision by Government of funds ample to cover the cost of the investigation, the offer of a monetary reward by the Society for the discovery of a method of immunity was quite unnecessary.

"In arriving at this decision, the Directors had in view the fact that a Committee of leading scientific investigators had been appointed by the Ministry of Agriculture to initiate and conduct research into the whole subject of foot-and-mouth disease, including the question of how infection is brought into the country, and the possibilities of dealing with the disease by a specific method of prevention. It was understood that a sum of £50,000 had been put at the disposal of the Committee, and that already three stations had been set up at which the investigations would be carried out."

Mr M'Laren further said that any interference by the Society or by any other outside body might not help, but might be a decided disadvantage to the Departmental Committee in carrying out their work. Although £50,000 had been earmarked, it was only right to say that the Government were quite prepared, he believed, to advance any reasonable sum over and above that amount, in order that the experiments might be carried to a successful issue.

Agricultural Education.

Sir DAVID WILSON of Carbeth, Bart., submitted a Report on the examination held at Leeds in April last for the National Diploma in Agriculture. 156 candidates presented themselves for examination. 74 candidates were from Scotland.

As a result of the examination, 53 diplomas were awarded, 4 with Honours.

Of the 156 candidates, 17 appeared for all the subjects, and of these 5 passed; 77 had passed certain subjects previously, and were completing the examination this year, and of these 48 obtained the diploma. The remaining 62 candidates presented themselves for a group of three or four subjects, and of these 26 passed in the subjects for which they appeared, and were entitled to appear for the remaining subjects in 1925.

Report by Chemist.

Dr J. F. TOCHER, Consulting Chemist to the Society, submitted a Report on the work done in his department during the past half-year.

The substance of Dr Tocher's Report appears on pp. 216-225 of this volume.

Fertilisers and Feeding Stuffs Act, 1906.

Dr J. F. TOCHER submitted the following statement, summarising the contents of the Report of the Departmental Committee on the Fertilisers and Feeding Stuffs Act, 1906 :—

"It would perhaps be appropriate if I drew the attention of members to the fact that the Report of the Departmental Committee on the Fertilisers and Feeding Stuffs Act of 1906 has just been presented to Parliament. You may remember that I was the only member of Committee appointed from Scotland, and therefore one had a serious responsibility in watching all Scottish interests during the inquiry. I am extremely glad to be able to say that the Report of the Committee was unanimous. The evidence of the representative of the Society was found to be very valuable to the Committee, and several suggestions made were adopted.

"The Committee has emphasised the fact that, taken as a whole, the trade in fertilisers and feeding stuffs is conducted on just and reasonable lines. There are individuals who are not above suspicion, and this fact is recognised not only by customers but by merchants and manufacturers. The vast majority of makers and distributors perceive that they are hurt by the action of a fraudulent minority."

The Committee was, therefore, not surprised to find that the traders were very willing to assist in finding some satisfactory method of putting a stop to dishonest and doubtful practices. The general problem which faced the Committee was to suggest a plan which would place the greatest possible restriction on fraud without interfering unnecessarily with freedom of commerce. The recommendations of the Committee if adopted will, the Committee believes, have a much greater deterrent effect than any method previously devised for these purposes; but it is not suggested that the Committee's plan, if adopted, would result in the detection of every case of adulteration or misrepresentation. No plan can be perfect. It is considered, however, to be a very practical plan, and, if adopted, will constitute a marked advance on existing provisions.

"The Committee recommends that every parcel of goods to which the criminal provisions of the new Act apply should, when prepared for consignment or delivery, be marked in such a way as will indicate to the purchaser the nature of the consignment and the name and address of the consignor. This marking and other information would constitute the description of the article, and failure to apply the description to the article and the name and address of the consignor or either of them, before consignment, should be an offence under the Act. The Committee further recommends that the State should confer on the relevant authorities such as authorised inspectors, a power of entry into all ports, factories, warehouses, stores, and shops in which fertilisers or feeding stuffs may be manufactured or stored, together with a power to take samples of goods prepared for consignment or delivery. There should also be a similar power of entry and of taking informal samples for the purposes of information in suspected cases of adulteration. The Committee considered that the bases of civil and criminal procedure should be clearly separated. The invoice should remain the foundation of civil claims, and the description proposed by the Committee to apply to the goods should become the basis of criminal proceedings. No notice of sampling should be required, and the period allowed for sampling should be extended to fourteen days after delivery of the goods. Definition is given of the terms 'formal', 'informal', and 'irregular' samples. 'Formal' samples are those taken under the provisions of the Act, while 'informal' samples are those taken by official samplers for the information of the authorities and of persons interested. No cognizance should be taken of samples which do not conform to the description of 'formal' and 'informal' samples. The presence of a deleterious substance in a feeding stuff or the addition to a feeding stuff of a worthless ingredient, the presence of which is not disclosed, should be an offence under the Act. The duty of administering the Act should be imposed on all local authorities, and power should be granted to local authorities to establish joint-committees for the purpose of carrying out the provisions of the new Act, including the exercise of the power of entry, of sampling, and of prosecution where necessary. Similar powers should be vested in the Ministry of Agriculture in England and the Board in Scotland. It is recommended that all the results of analyses of formal samples should be published annually by local authorities, together with the names and addresses of sellers and consignors. A very important recommendation of the Committee is that the scope of the new Act should be defined by specially constructed schedules. These schedules should indicate, in respect of fertilisers and feeding stuffs, the name of each article or class of article to which the Act should apply; the definition of the substance named; the particulars to be stated in the invoice for the purpose of the civil warranty, and the particulars to be stated in the description for the purpose of the criminal provisions of the Act.

"The last main recommendation of the Committee is that a Statutory Standing Advisory Committee should be constituted for the purpose of discharging the following important functions, namely:—

1. To draw up Schedules for the purpose of prescribing—
 - (a) The fertilisers and feeding stuffs to which all the provisions of the Act should apply and those to which only the civil provisions should apply.
 - (b) Definitions of each of the articles or classes of articles to which the Act should apply.
 - (c) The statements as to the constituents present, and also, possibly, as to the absence of certain substances in some instances, which should be given by the seller for the information of the farmer in the case of each article.
 - (d) Those commodities which should be regarded as 'worthless' or 'deleterious.'
2. To recommend the terms in which the valuable constituents should be stated in the invoice (e.g., whether phosphates should be stated as phosphoric acid or as tri-calcium phosphate).
3. To review the limits of variation and recommend any necessary alterations or additions.

- " 4. To consider the form of code signs and registered marks and the methods of application.
- " 5. To review the existing Regulations, and suggest such amendments and additions as may be thought desirable.
- " 6. To recommend from time to time such alterations to the Schedules and Regulations as may become necessary."

The Report can be obtained through any bookseller, or from the Stationery Office in Scotland at 120 George Street, Edinburgh. The number of the Report is Cmd. 2125, and the price is 1s.

Mr T. A. BUTTAR, Corston, asked what was the position in regard to lime under the Fertilisers and Feeding Stuffs Act. Lime was largely used now, but the difficulty was that they could get no guarantee from sellers.

Dr TOCHER said that the Act contained no reference to a guarantee as to lime, although most manufacturers gave such a guarantee, and farmers should insist on a guarantee being given. It was unnecessary for the Committee to consider what substances should be included, because they recommended the appointment of an Advisory Committee to determine what should be included, and no doubt lime would be one of these.

Grass Sickness.

Dr Tocher also mentioned that those who desired to protect horses against grass sickness should now inoculate with the preventive serum. Two doses should be applied, and these could be obtained from the owner's own veterinary surgeon. The veterinary surgeon might not have the serum in stock, but he could, if requested by his client, get a supply in the course of twenty-four hours. The mortality among inoculated horses during the seasons 1922 and 1923 was five times less than the mortality among uninoculated horses on the same farms. Hence, at present, prevention by inoculation was the only known method of combating the disease.

The proceedings terminated with a cordial vote of thanks to the Chairman, on the motion of Mr J. T. M'LAREN.

GENERAL MEETING OF MEMBERS HELD IN THE SHOWYARD, PERTH, 16TH JULY 1924.

The DUKE OF ATHOLL, K.T., President of the Society, in the Chair.

In welcoming the members, the PRESIDENT said that so far they had had extraordinary luck as regards the weather. They had a very good Show, in spite of many circumstances which at one time made it doubtful whether or not they could proceed with the event. Further, the attendance, so far, was a record one, for Perth at all events, and he had every reason to believe that the public were well pleased with what was to be seen.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, Chairman of Directors, proposed a vote of thanks to the Lord Provost, Magistrates, and Town Council of the City of Perth for all they had done in connection with the visit of the Show to that centre. They had, he said, given many things to the Society in their effort to make the visit a successful and memorable one. They had given a handsome donation in money, placed at the disposal of the Society one of the finest sites free of expense, also a free water supply and facilities for lighting. There had been many changes during the period of twenty years since the Show was last held at Perth, but there had been no change in the capable management of the affairs of the city. Mr M'Laren added that he could recall the Perth Show of 1879, on which occasion the elements were not propitious, visitors to the Show then having to walk on planks and straw. The then Lord Provost could not be held responsible for the weather. The present Lord Provost, however, was doing his best in that direction, and the outlook was promising.

Colonel F. J. CARRUTHERS of Dorinont, Lockerbie, seconded.

The HON. JOHN DEWAR, Lord Provost of Perth, in reply, said it had given the city of Perth the greatest pleasure to welcome the Society's 93rd Show in their midst. That was the tenth Show held in their city, and he was sure it would mark, as its predecessors had done, another milestone in the march of scientific agriculture.

Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., Hon. Secretary of the Society, moved a vote of thanks to the convener and members of the Local

Committee of Management for the successful manner in which they had carried through the Show arrangements. However industrious and efficient the chairman, secretary, and headquarters staff of the Society might be, no Show could be a success without the steady assistance of the Local Management Committee.

Mr JOHN M'CAIG of Belmont, Stranraer, seconded.

Mr THOMAS A. BUTTAR, Corston, Convener of the Shows Committee, replied.

On the motion of Mr A. A. HAGART SPEIRS of Elderslie, a cordial vote of thanks was passed to the President for presiding.

The DUKE OF ATHOLL, in acknowledging, said that they on the land had experienced difficult times, and he was afraid they still had difficult times to look forward to. He did not think that any one who looked forward would have the opinion that the agricultural interests were going to have a particularly easy time. The arable farmer, in his opinion, was a wonderful man. He was the salt of the earth. He went on in spite of discouragement and set-backs both from nature and from those whom Providence set above him. It was very difficult for agriculturists to know where they were at the present time, and what was going to happen next. One thing they did want for agriculture in this country was stability, to be left alone, and to be allowed to work out their own salvation on reasonable and practical lines. The Government could help, but only when farmers told the Government how they wanted to be helped. The last thing they wanted was assistance, he would not say from the Government or experts, but from the other people in Government offices who really did not know the work of agriculture as well as those who were engaged in it. What they wanted to tell the Government was where they could be helped, and in that way they would advance their own and the interests of the country very much. The last thing they wanted, at any rate, was unreasonable interference. They quite admitted that there was a great deal of room for scientific education in agriculture, and that much could be done in that direction. They had many scientific as well as practical men, and he was quite sure that as the general education of the whole country increased the farmers of Scotland would be the first to welcome the teachings of the scientists, and to put them into practice. Another thing he felt certain about was that every farmer, no matter what his politics might be, should put his foot down and say they would not have agriculture made into a political toy for any one party or another.

ANNIVERSARY GENERAL MEETING, 7TH JANUARY 1925.

Sir DAVID WILSON, D.Sc., of Carbeth, Bart., in the Chair.

New Members.

Two hundred and seventy-four candidates for election were balloted for and admitted Members of the Society.

Vacancies on Board of Directors.

Mr J. T. M'LAREN, The Leuchold, Dalmeny, Chairman of Directors, moved the following recommendations of the Board of Directors—(a) that Dr Thomas G. Nasmyth, Canaan Lodge, 43 Canaan Lane, Edinburgh, be elected an Ordinary Director for the Edinburgh Show Division, to fill the vacancy caused by the death of the late Sir John A. Hope, Bart.; (b) that Mr Peter Grant, The Hotel, Carr Bridge, be elected an Ordinary Director for the Inverness Show Division, to fill the vacancy caused by the death of the late Mr Andrew B. Leitch.

The motion was unanimously adopted, and the gentlemen named were duly elected.

Finance.

Mr JAMES R. LUMSDEN of Arden submitted the Accounts of the Society for the year to 30th November 1924. The receipts for the year from all sources reached a total of £27,219, 12s. 2d. This sum exceeded the outlays by £3799, 15s. 7d. Life subscriptions amounted to £1213, 4s. In the past year the expenditure on educational work amounted to £184, 5s. 3d., and on the work in the chemical, veterinary, and botanical departments to £676, 4s. 7d.

He moved the approval of the usual grant of £5 to the Society for the Prevention of Cruelty to Animals for the year 1925.

Mr G. BERTRAM SHIELDS, Dolphinstone, Tranent, seconded.

Mr ARCHIBALD MACNEILAGE, Glasgow, called attention to two items in the Accounts. On page 5 there was an entry of £98, 7s. 9d. for Long Service Certificates and Medals. He had been asked by a member of the Society—whose father had also been a member, but who resided in Northern Ireland—to bring before the Meeting the refusal by the Directors to grant a Long Service Certificate and Medal to an employee who had been sixty-two years in their employment. The ground on which refusal had been made was that the employer resided in Northern Ireland. If the Society had accepted his membership fee, and his father's before him, it seemed to him that an explanation was due by the Directors to the members of the Society regarding such refusal. If there was anything in the Charter that debarred benefits from being conferred on members outwith Scotland, he thought members and prospective members should know it.

Mr MacNeillage further pointed out that, on page 6 of the Accounts, there was stated to be £479, 11s. 5d. due to the Society by exhibitors for work done on their stands at Perth Show. He had been responsible for stands for the last forty years, and always had to pay before he left the Showyard. How people occupying stands should leave these accounts unpaid to the 30th of November was something, he thought, that should be explained by the Finance Committee.

The SECRETARY, dealing with the second point first, said he was sure that the Society and the Finance Committee would be grateful if all exhibitors paid their accounts as promptly as the last speaker. The accounts were not all sent out until September, and he did not think that a sum of £479 outstanding, out of a total revenue of £2000 from this source, after a lapse of only two months, was very serious. The Society would be only too glad if the money could be got in before 30th November.

With regard to the Long Service Certificates and Medals, the Secretary pointed out that these awards were part of the Society's scheme of Local Grants. They were not based on membership of the Society—that was to say, a ploughman or shepherd did not depend on his employer being a member of the Society to entitle him to receive one of these awards. It would be a great hardship if it were so. Many a farm worker and shepherd would be debarred on account of his employer not being a member. The awards came under the Society's scheme of Local Grants, and the basis of the award was long and approved service in Scotland. The Society's activities were restricted by Charter to Scotland.

The CHAIRMAN said that this was not a privilege of membership. It was a gift to old servants in Scotland, and not to old servants in Ireland or England. It was given to those who had served in Scotland.

The Accounts were then approved.

Argyll Naval Fund.

Sir HUGH SHAW STEWART, C.B., of Greenock and Blackhall, Bart., submitted the report on the Argyll Naval Fund for 1923-24, which showed that the income for the year amounted to £342, 2s. 11d., while the expenditure was £320, 3s. 3d., in grants to eight naval cadets, and £9, 3s. 3d. for advertising.

Perth Show, 1924.

Mr THOMAS A. BUTTAR, Corston, Coupar-Angus, reported upon the Show held at Perth in July 1924. (For substance of the Report see p. 283 of this volume.)

Glasgow Show, 1925.

Mr JOHN SPEIR, Newton, Glasgow, Convener of the Shows Committee, reported that arrangements were well advanced for the Show to be held at Glasgow on Tuesday, 14th July 1925, and three following days. The southern portion of Bellahouston Park, which had been placed at the disposal of the Society by the Corporation of Glasgow, provided an excellent and commodious site, which was readily accessible both by railway and tramway car. In addition, the Corporation were providing a free supply of water for the Show, and had promised a donation of 500 guineas to the Show Funds. The Prize List, then in course of preparation, was on a generous scale, the amount to be offered in prizes from the Society's own funds reaching a total of about £3614, compared with £2818 at Paisley in 1913. In addition, there were the usual large number of valuable Challenge Cups, Medals, and Special Prizes, besides prize-money contributed by Breed Societies and private donors. A considerable number of extra classes have been added, amongst which might be mentioned extended classes for Hunters and Harness Horses, classes for Draught Geldings in Harness, Children's Riding Classes, and a new section for Large White Ulster Pigs. It was unfortunate that the Royal Agricultural Society of England had fixed the date of its Show at Chester

for the week immediately preceding the Highland Show, as this was bound to entail considerable inconvenience to exhibitors of Implements and Machinery. The Directors were unable to take any action to overcome the difficulty, as Glasgow Fair holidays occurred in the week following the Show, thus precluding any possibility of postponement.

Peebles Show, 1926.

Mr THOMAS ELDER of Stevenson reported that the Show of 1926 fell to be held in the Border Show Division, and the Directors had resolved that the Show take place at Peebles. This decision was arrived at after receiving the report of a Special Committee which visited and inspected the various sites offered, and obtained full information as to railway and other facilities available at the different centres. The site at Peebles was ample in extent and conveniently situated. The town was served by two Railway Companies, accommodation in the Hydropathic and hotels was better than in any of the other towns visited, and its greater accessibility to Edinburgh would meet the convenience of visitors who were unable to secure accommodation locally. The Local Authorities of both the town and county were co-operating to further the success of the Show, and, besides providing a free site and water supply, had promised to raise a contribution of £1000 to the Show Funds.

In supplementing his report, Mr Elder said there had been some criticism of their action in fixing on Peebles. The one aim of the Committee was to make the Show of 1926 a success. They had visited all the places offered, and had taken everything into consideration. The want of sufficient railway facilities at Kelso was the great obstacle in the way of making the Show a success there. If the Show of 1926 were to be a success, no other decision than that reached by the Directors could be arrived at.

Mr JAMES ROBERTSON, Morebattle Tofts, Kelso, having been informed by the Chairman that he could not move that the Show be held at another centre, but that he could move that the report be not adopted, took the latter course, and moved accordingly. He said there were other districts in the Borders, lower down on the Tweed, which had better claims to the Show than Peebles, which was high up near the source of the Tweed. He did not think the claims of these wider districts should be ignored. There was a precedent for his action in what took place in the Dumfries Showyard in 1910. In that case it was proposed that the Show of 1912 be held at Perth. Lord Ninian Crichton-Stuart moved that the Show be held at Cupar. His Lordship based his argument on the right of the members to have the Show go round, and that it should visit the districts which were most important from the agricultural point of view. These were some of the arguments in favour of the Show being held elsewhere than at Peebles.

Mr ROBERT GRAHAM, Kaimfist, Kelso, seconded. Why, he asked, should the Highland Society go to Peebles instead of to thriving agricultural districts like Roxburghshire and Berwickshire? In Peeblesshire they had 97 members, in Roxburghshire 259, and in Berwickshire 172. In addition, Kelso was a very much more convenient centre for the English members, numbering 582. They in the Border district were not taking a narrow view at all. Did the Society exist for the officials or for the good of agriculture? Did the convenience of Edinburgh make one iota of difference for the Highland Show, seeing it was to be in Edinburgh in 1927? There was a great deal said about the railway facilities. They had a double railway at Kelso, and if the railway company had been and were still approached in a reasonable manner he was sure they would provide the facilities for the Show at Kelso. He would not have objected to the Show going to the Hawick district, but to go to a pastoral district like Peebles was out of the question.

Mr J. T. M'LAREN, Chairman of Directors, said it was evident from the large and representative turn-out at that Meeting that the allocation of Peebles as the site for the Show had aroused intense interest among the members of the Society. It was due to the members in the Kelso district to give some explanation of the decision they had come to in selecting Peebles and not one of the other Border towns. They received invitations from four different centres—Hawick, Berwick-on-Tweed, Kelso, and Peebles. So far as the Sites Committee were concerned, they started their investigations with a bias in favour of holding the Show at Kelso. They recognised that it was a very large agricultural district, where the Show had not been held for at least a quarter of a century. They did not look at the question entirely from a financial point of view. They recognised that it would be in the interests of the Society to hold the Show at Kelso after a lapse of so many years, but when they looked into the question of the railway facilities, they found there were difficulties which could not be overcome. They held conferences with the railway officials; they visited the Kelso district more than once, and tried to view the question from every point of view. He quoted a letter from the super-

intendent of traffic for the district, Major Stemp, and directed their special attention to the first paragraph of the letter, which was as follows :—

"In view of your special reference to the desire to hold the Show at Kelso in 1926, I visited that place on Friday last, and went fully into the question of the suitability of that station from the Railway Company's point of view. There would be no difficulty in conveying the passengers to and from Kelso, although the platforms at that station are narrow—particularly at the point where the road bridge crosses the railway,—but, owing to the inadequacy of siding and loading bank facilities, a very difficult problem presents itself in connection with the manipulation of the live stock, &c., traffic."

Mr M'Laren then quoted the following further paragraph from Major Stemp's letter :—

"On the last occasion when the Show was held at Kelso, in 1898, the number of vehicles despatched with live stock was approximately 220, and the time taken to load and despatch these was from about 6 p.m. till about 2 a.m. On this occasion a temporary loading bank was erected, at considerable expense, on the main line north of the station, in the direction of Edinburgh, which accommodated about 27 waggons; but the expense of providing a similar facility in 1926 would be so heavy, owing to the greatly increased costs, that I am afraid the Railway Company would not be prepared to consider such provision for the Show now under review."

"We would then (in 1926) have to confine the loading and despatch of the live stock to the present accommodation, and, taking the figures of the live stock vehicles despatched from Hawick in 1914, viz.:—364, and working them out to the closest possible margin of despatch between trains, it is obvious that the last of the live stock could not possibly be cleared away until between noon and 2 p.m. of the following day."

What other recommendation, Mr M'Laren continued, could the Board make than that Kelso was an impossible place for the Show of 1926? Major Stemp's letter could bear no other interpretation than that if the Show were held at Kelso he would not be responsible for the efficient working of the Show traffic. They had made what they considered the best recommendation under the circumstances, and he hoped the Meeting would homologate what they had done.

Mr A. D. MACDONALD, Lennel, Coldstream, said that Major Stemp indicated that the provision of accommodation was a question of expense. He suggested that the Society might give financial assistance to the Railway Company in providing facilities.

Mr GEORGE W. CONSTABLE, Traquair, Innerleithen, recalled the fact that after the Kelso Show of 1898 the feeling was general that never again would a Highland Show be held at Kelso. The railway facilities had not been improved since that date, and he accordingly thought the Directors were fully justified in their decision.

Mr J. R. C. SMITH, Mowhaugh, Kelso, said that in the case of Peebles they had a wide district with comparatively few agricultural workers, whereas Kelso was the centre of a district with a large agricultural population. The Highland Society was an educational body. They made a stupid mistake when they ignored that large agricultural population in Roxburghshire and Berwickshire. It was their duty to consider the matter from that point of view. Unless the Society was going to cut off Roxburghshire and Berwickshire from its clientele, they should visit these districts once in a quarter of a century. It was not only their duty, but it was to the advantage of the Society to hold their Meeting at the most important agricultural centre on the Tweed, instead of going away to the top of the hills where the Tweed rose.

Mr MICHAEL G. THORBURN, Glenormiston, Peebles, said that twenty years ago they had the Show at Peebles, and it was the first Show in the Border district which had paid its way. Their railways were in first-class order, and they had plenty of accommodation for all kinds of traffic. Their roads were amongst the best in Scotland. If Roxburghshire had paid more attention to its roads it would have had a stronger claim. The Directors, he thought, had arrived at a wise decision.

Mr ATHOLE S. HAY, Marlesfield, Roxburgh, pointed out that if the Show were held at Peebles in 1926, the Society was actually proposing to hold three shows in succession in an area covered by a twenty-mile radius, ignoring the wide agricultural area of the south-eastern border altogether. Farmers in that district could easily go to Peebles, but their employees could not.

Mr W. G. HOGARTH, Linton Bankhead, Kelso, said that he had been a member of the Society for about fifty years. He prized the educational value of its Shows, and for that reason he protested against depriving the agricultural population

of the two Border counties of the opportunity of seeing the Show. They were out off from the Highland Society altogether.

Mr BAILIE WILLIAM POOLE, J.P., Edinburgh, speaking on behalf of implement exhibitors, said there was no doubt that the implement trade would be in favour of Kelso, as it was the centre of a wide arable area.

Mr ROBERT BRUCE, Thirlestane, Lauder, said there was no difficulty in getting away stock from the Kelso ram sales. They had as many as 400 waggons to load after a ram sale.

The CHAIRMAN said he had a great deal of sympathy with everything that had been said about Kelso. At the same time, as a Director he felt with his co-Directors the responsibility of trying to run a Show in a place where the railway company told them that they would not be responsible for anything that happened. It was entirely the railway facilities which led the Directors, very much against their will, to decide that until things were better as regards railway accommodation at Kelso they did not see their way to go there.

On a division the amendment, that the report by the Directors be not adopted, was carried by 96 votes to 49.

The Chairman pointed out that the decision not to approve of the report did not involve the Show being held in another place than Peebles. He asked the Secretary to explain the position as affected by the terms of the Society's charter.

The SECRETARY said the charter of 1834 provided that the Directors "shall manage and direct the ordinary business of the Society in all matters in compliance with the constitution, by-laws, and regulations of the institution." It appeared, therefore, that the matter of deciding where the Show was to be held was the business of the Board of Directors. That was the view taken by the Directors and by the Directors' legal advisers. The effect of a report being not approved by the General Meeting was to his mind similar to the effect of a vote of no confidence. It could not affect the decision the Directors had arrived at. If the members were dissatisfied with the action of the Directors, it was open to them not to return them to the Board again.

Mr THOMAS ELDER said the Meeting had not agreed with the motion which the Directors had passed. Were they not now as Directors in the position that they had to reconsider the position in accordance with the views of the Meeting?

Sir ISAAC CONNELL said he agreed with the Secretary as to the strictly legal position, but he also agreed with Mr Elder and with the great body of that Meeting that the Directors had it in their power to reconsider their decision. It was usual for people who occupied a representative position either to bow to the majority of their constituents or to resign. It was competent for the Directors to reconsider the question. It was equally competent for them to stick to their guns, but the latter course would be an unusual one in a civilised community.

Mr ARCHIBALD MACNEILAGE, Glasgow, moved that in view of the vote now taken, the Meeting respectfully ask the Directors to reconsider their decision to hold the Show of 1926 at Peebles.

Mr JAMES ROBERTSON seconded.

The CHAIRMAN suggested that, after the expression of opinion given by the Meeting, it might be left to the Directors to reconsider the question. He took it upon himself to assure them that that would be done, and in the circumstances he suggested that the motion might not be pressed. This was agreed to.

Show of 1927.

Mr J. T. M'LAREN moved the following resolution, which had been that day adopted by the Board of Directors: "That, provided a suitable site is available, and satisfactory financial and other arrangements can be made, the Society's Show of 1927 be held in the Edinburgh Show Division."

Mr DUNCAN M'LAREN, Fairington, seconded, and the motion was carried unanimously.

Grants to Local Societies.

Mr JAMES M'LAREN, Cornaton, submitted the report on District Shows and Competitions, showing that in 1924 grants of money and medals had been given in 68 districts. The total expenditure under this head amounted to £700, 8s. 9d. For the current year the Directors proposed the following grants: Under section 1, twenty-one districts for grants of £12 each for cattle, horses, and sheep, and eight districts in intermediate competition, with a grant of three silver medals to each; under section 2, nine districts for grants of £15 each for stallions; special grants of £15 to the Northern Arts and Crafts Society; £60 for Federations of Women's Rural Institutes; £20 to Kilmarnock Cheese Show; £3 to Orkney; £3 to Sanday, Orkney; £3 to East Mainland, Orkney; £3 to West Mainland, Orkney; £3 to

Walls and Hoy Agricultural Society ; and £3 to Kilmuir (Skye) Show Committee ; a gold medal and a silver medal to the British Dairymaids' Association ; nineteen districts for two medals each ; the usual medals at ploughing and hoeing competitions ; two medals each to three districts for cottages and gardens ; Long-Service Medals and Certificates, say, £102, 10s., making the total sum offered in 1925, £772, 11s.

Science.

Report by Chemist.

Dr J. F. TOCHER, Consulting Chemist to the Society, reported on the work of the department during the year 1924.

The substance of Dr Tocher's report appears on pp. 216-225 of this volume.

Education.

Colonel F. J. CARBUTHERS of Dormont, Lockerbie, Convener of the Education Committee, reported on the results of the twenty-ninth examination held last autumn for the National Diploma in Dairying. At the examination in England there were 71 candidates, of whom 41 obtained the diploma and 30 failed ; at the examination in Kilmarnock there were 60 candidates, 25 obtaining the diploma and 35 failing. The Diploma with Honours was awarded to 3 of the successful candidates at the English centre, and 4 at the Scottish centre. The names of the successful candidates, as well as the names of the winners of the National Diploma in Agriculture at the examination held last April, would be published in the next volume of 'Transactions.'

The examinations for these diplomas would again be held during the ensuing year.

The Society's examination for First and Second Class Certificates in Forestry would be held on 17th, 18th, and 19th March, provided a sufficient number of candidates presented themselves for examination.

On the motion of Mr J. T. M'LAREN, a hearty vote of thanks was accorded to Sir David Wilson for presiding.

APPENDIX

PREMIUMS

OFFERED BY

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND IN 1925

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GENERAL NOTICE.

THE HIGHLAND SOCIETY was instituted in the year 1784, and incorporated by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Beards of Management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have since been continuously directed to the promotion of the science and practice of agriculture in all its branches.

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c., held in the principal towns of Scotland, at which exhibitors from all parts of the United Kingdom are allowed to compete.

2. A system of District Shows instituted for the purpose of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Associations.

3. The encouragement of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising the Society to grant Diplomas to Students of Agriculture; and by giving grants in aid of education in Agriculture and allied sciences. In 1900 the Society discontinued its own Examination, and instituted jointly with the Royal Agricultural Society of England an Examination for a National Diploma in Agriculture.

4. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise. Terminated in 1881 in accordance with arrangements with the Royal College of Veterinary Surgeons.

5. The institution of a National Examination in Dairying, jointly with the Royal Agricultural Society of England.

6. The institution of an Examination in Forestry for First and Second Class Certificates.

7. The appointment of a chemist for the purpose of promoting the application of science to agriculture.

8. The establishment of a Botanical Department.

9. The appointment of Entomologist to advise members regarding insect pests.

10. The annual publication of the 'Transactions,' comprehending papers by selected writers, Prize Reports, and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications.

11. The management of a fund left by John, 5th Duke of Argyll (the original President of the Society), to assist young natives of the Highlands who enter His Majesty's Navy.

CONSTITUTION AND MANAGEMENT.

The general business of THE HIGHLAND AND AGRICULTURAL SOCIETY is conducted under the sanction and control of the Royal Charters, referred to above, which authorise the enactment of Bye-Laws.

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty-two Ordinary and Twenty Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers.

The Supplementary Charter of 1856 provides for the appointment of a Council on Education, consisting of Sixteen Members—Nine nominated by the Charter, and Seven elected by the Society.

PRIVILEGES OF MEMBERS

MEMBERS OF THE SOCIETY ARE ENTITLED—

1. *To receive a free copy of the 'Transactions' annually.*
2. *To apply for District Premiums that may be offered.*
3. *To report Ploughing Matches for Medals that may be offered.*
4. *To Free Admission to the Shows of the Society.*
5. *To exhibit Live Stock and Implements at reduced rates.¹*
6. *To have Manures and Feeding-Stuffs analysed at reduced fees.*
7. *To have Seeds tested at reduced fees.*
8. *To have Insect Pests and Diseases affecting Farm Crops inquired into.*
9. *To attend and vote at General Meetings of the Society.*
10. *To vote for the Election of Directors, &c., &c.*

ANALYSIS OF MANURES AND FEEDING-STUFFS

The Fees of the Society's Chemist for Analyses made for Members of the Society shall, until further notice, be as follows :—

The estimation of one ingredient in a manure or feeding-stuff	5s.
The estimation of two or more ingredients in a manure or feeding-stuff	10s.

These charges apply only to analyses made for the sole and private use of Members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

The Society's Chemist, if requested, also supplies valuations of manures, according to the Society's scale of units.

SEEDS, CROP DISEASES, INSECT PESTS, &c.

The rates of charges for the examination of plants and seeds, crop diseases, insect pests, &c., will be had on application to the Secretary.

ELECTION OF MEMBERS

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June. It is not necessary that the proposer should attend the Meeting.

CONDITIONS OF MEMBERSHIP

Higher Subscription.—The ordinary annual subscription is £1, 3s. 6d., and the ordinary subscription for life-membership is £12, 12s.; or after ten annual payments have been made, £7, 7s.

Lower Subscription.—Proprietors farming the whole of their own lands, whose rental on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Secretaries or Treasurers of Local Agricultural Associations, Factors resident on Estates, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, and such other persons as, in respect of their official or other connection with Agriculture, the Board of Directors may consider eligible, are admitted on a subscription of 10s. annually, which may be redeemed by one payment of £7, 7s., and after eight annual payments of 10s. have been made, a Life Subscription may be purchased for £5, 5s., and after twelve such payments, for £3, 3s.² Subscriptions are payable on election, and afterwards annually in January.

Members are requested to send to the Secretary the names and addresses of Candidates they have to propose (stating whether the Candidates should be on the £1, 3s. 6d. or 10s. list).

JOHN STIRTON, *Secretary.*

3 GEORGE IV. BRIDGE, EDINBURGH.

¹ Firms are not admitted as Members; but if one partner of a firm becomes a Member, the firm is allowed to exhibit at Members' rates.

² Candidates claiming to be on the 10s. list must state under which of the above designations they are entitled to be placed on it.

ESTABLISHMENT FOR 1924-1925.

President:

The LORD BLYTHSWOOD, K.C.V.O., Blythswood, Renfrew.

Vice-Presidents.

The MARQUIS OF AILSA, Culzean Castle, Maybole.

The MARQUIS OF GRAHAM, C.B., Brodick Castle, Isle of Arran.

Sir ROBERT KING STEWART of Murdostoun, Newmains.

The Right Hon. MATTHEW WALKER MONTGOMERY, Lord Provost of the City of Glasgow, City Chambers, Glasgow.

Year of
Election.

Ordinary Directors.

- Lieut.-Col. W. T. R. HOULDSWORTH of Kirkbride, Maybole.
Major MARK SPROT of Riddell, Lilliesleaf.
Dr THOMAS G. NASMYTH, Canaan Lodge, 43 Canaan Lane, Edinburgh
(elected 7th January 1925).
- 1921 JOHN P. SLEIGH of St John's Wells, Fyvie.
ALEXANDER ROBERTSON, Estate Office, Polmaise, Stirling.
GEORGE WILL, Crichton Royal Institution, Dumfries.
PETER GRANT, The Hotel, Carr-Bridge, Strathspey (elected 7th
January 1925).
The DUKE OF ATHOLL, K.T., G.C.V.O., C.B., D.S.O., Blair Castle, Blair-
Atholl.
DUNCAN M'LAREN of Fairnington, Roxburgh.
G. BERTRAM SHIELDS, Dolphinstone, Tranent.
FALCONER L. WALLACE of Candaeraig and Balcairn, Strathdon,
Aberdeenshire (Upper Feilde, Park Street, London, W. 1).
- 1922 JAMES RODGER, Rochdale Lodge, Bridge of Allan.
Colonel F. J. CARRUTHERS of Dormont, Lockerbie.
Captain JOHN MACGILLIVRAY of Calrossie, Nigg, Ross-shire.
JOHN STEWART of Stiuthers, J.P., Woodburne House, Ceres, Fife.
ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
THOMAS ELDER of Stevenson, Haddington.
ALEXANDER FORBES, Rettie, Banff.
JAMES GRAY, Birkenwood, Kippen Station.
JOHN M'CAIG of Belmont, Stranraer.
- 1923 THOMAS ELLIOT, Seiberscross, Rogart.
The EARL OF ELGIN AND KINCARDINE, C.M.G., Broomhall, Dun-
fermline.
A. A. HAGART SPEIRS of Elderslie, Houston House, Houston.
Major ROBERT W. SHARPE of The Park, Earlston.
WILLIAM LOW of Balmakewan, Marykirk, Montrose.
J. ERNEST KERR of Harviestoun, Dollar.
ROBERT MACMILLAN of Holm of Dalquharrin, Woodlea, Moniaive.
- 1924 ALEXANDER P. GORDON of Bindal, Portmahomack.
WILLIAM S. NIVEN, The Loan, Errol.
WILLIAM ELLIOT, Muirglen, Lanark.
JOHN ELLIOT, Balmakiel, Galashiels.
HARRY ARMOUR, J.P., Niddry Mains, Winchburgh.

Extraordinary Directors.

- W. P. GILMOUR, Balmangan, Kirkcudbright.
 JAMES M'LAREN, Cornton, Stirling.
- 1923 } JAMES DURNO, Crichtie, Inverurie.
 Major JAMES KEMP SMITH (Messrs Kemp & Nicholson), Stirling.
 THOMAS A. BUTTAR, Corston, Coupar-Angus.
 J. T. M'LAREN, The Leuchold, Dalmeny House, Edinburgh.
- 1924 } JAMES GRIEVE of Rumbletonlaw, Greenlaw.
 JAMES R. LUMSDEN of Arden, Dunbartonshire.
 JAMES M'QUEEN of Crofts, Dalbeattie.

Shew District.

- N. H. CONSTABLE, Bute Estate Office, Rothesay.
 JAMES GARDNER, South Hillington, Cardonald.
 JAMES A. HUNTER, Machribeg, Campbeltown.
 Bailie GEORGE KERR, City Chambers, Glasgow.
- 1924 } Sir JOHN MAXWELL STIRLING MAXWELL of Pollok, Bart., Pollok
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 A. W. MONTGOMERIE, Leesnessnock, Ochiltree.
 ROBERT G. MURRAY of Spittal, Biggar.
 Sir THOMAS PAXTON, Bart., LL.D., 22-28 Adelphi St., Glasgow, S.S.
 JOHN SPEIR, Newton Farm, Hallside, Glasgow.
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Office-Bearers.

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 R. C. TODD, *Second Clerk*.
 WILLIAM HOME COOK, C.A., 42 Castle Street, *Auditor*.
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 *Consulting Botanist*.
 R. S. MACDOUGALL, M.A., D.Sc., 9 Dryden Place, *Consulting Entomologist*.
 TODD, MURRAY, & JAMIESON, W.S., 66 Queen Street, *Law Agents*.
 WILLIAM BLACKWOOD & SONS, 45 George Street, *Publishers*.
 HENRY MUNRO, Ltd., 82 Mitchell Street, Glasgow, *Advertising Agents*.
 HAMILTON & INCHES, Princes Street, *Silversmiths*.
 ALEXANDER KIRKWOOD & SON, 9 St James' Square, *Medallists*.
 JOHN REID, 55 Blenheim Place, Aberdeen, *Showyard Erector*.
 ANDREW BROWN, *Messenger*.

Chairman of Board of Directors.

- J. T. M'LAREN, THE LEUCHOLD, DALMENY HOUSE, EDINBURGH.

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1. *Argyll Naval Fund* . . . Colonel Sir JOHN GILMOUR, Bart., M.P., D.S.O.
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3. *Publications* . . . Lieut.-Col. W. T. R. HOULDSWORTH of
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8. *Education* . . . Colonel F. J. CARRUTHERS of Dormont.
9. *Forestry* . . . Sir HUGH SHAW STEWART, Bart., C.B.
10. *Office-Bearers* . . . J. T. M'LAREN, The Leuchold, Dalmeny.

COMMITTEES FOR 1924-1925.

1. ARGYLL NAVAL FUND.

Colonel Sir JOHN GILMOUR, Bart., M.P., D.S.O., of Montrave, Leven,
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 J. ERNEST KERR of Harviestoun, Dollar.
 JAMES R. LUMSDEN of Arden, Dumbartonshire.
 JOHN M'CAIG of Belmont, Stranraer.
 JAMES M'LAREN, Cornton, Stirling.
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 WILLIAM LOW of Balmakewan, Marykirk, Montrose.
 JOHN M'CAIG of Belmont, Stranraer.
 ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
 ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
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 G. BERTRAM SHIELDS, Dolphingstone, Tranent.
 JOHN SPEIR, Newton Farm, Hallside, Glasgow.
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 JOHN M'CAIG of Belmont, Stranraer.
 Captain JOHN MACGILLIVRAY of Calrossie, Nigg, Ross-shire.
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 JAMES M'LAREN, Cornton, Stirling.
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5. IMPLEMENTS AND MACHINERY.

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6. SCIENCE.

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 JAMES M'LAREN, Cornton, Stirling.
 ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
 Dr THOMAS G. NASMYTH, Cansan Lodge, 43 Cansan Lane, Edinburgh.
 ALEXANDER ROBERTSON, Estates Office, Polmaise, Stirling.
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G. BERTRAM SHIELDS, Dolphingstone, Tranent.
 JOHN SPIRIB, Newton Farm, Hallside, Glasgow.
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 Major MARK SPROT of Riddell, Lilliesleaf.
 JOHN STEWART of Struthers, J.P., Woodburne House, Ceres, Fife.
 FALCONER L. WALLACE of Candacraig and Balcairn, Strathdon.
 Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B.,
 Ardgowan, Inverkip, Hon. Secretary, *ex officio*.
 Dr J. F. TOOHER, 41½ Union Street, Aberdeen, Chemist, *ex officio*.
 Botanist, *ex officio*.
 R. S. MACDOUGALL, M.A., D.Sc., 9 Dryden Place, Edinburgh, Zoologist,
ex officio.

7. GENERAL PURPOSES.

J. T. M'LAREN, The Leuchold, Dalmeny House, Edinburgh, Chairman,
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 JOHN ELLIOT, Balnakiel, Galashiels.
 WILLIAM ELLIOT, Muirglen, Lanark.
 JAMES GRAY, Birkenwood, Kippen Station.

JAMES M'LAREN, Cornton, Stirling.
 ROBERT MACMILLAN of Holm of Dalquhairn, Woodlea, Moniaive.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
 G. BERTRAM SHIELDS, Dolphingstone, Tranent.
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 Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B.,
 Ardgowan, Inverkip, Hon. Secretary, *ex officio*.

8. EDUCATION.

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 G. BERTRAM SHIELDS, Dolphingstone, Tranent.
 Sir DAVID WILSON, Bart., D.Sc., of Carbeth, Killearn, Treasurer, *ex officio*.
 Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B.,
 Ardgowan, Inverkip, Hon. Secretary, *ex officio*.
 JOHN STIRTON, *Secretary*, Highland and Agricultural Society.

9. FORESTRY.

Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B.,
 Ardgowan, Inverkip, Hon. Secretary, *Convener*.
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 Atholl.
 Colonel F. J. CARRUTHERS of Dormont, Lockerbie.
 JAMES I. DAVIDSON, Saughton Mains, Corstorphine.
 The EARL OF ELGIN AND KINCARDINE, C.M.G., Broomhall, Dunfermline.
 Sir JOHN R. FINDLAY of Aberlour, 27 Drumsheugh Gardens, Edinburgh.
 WALTER STEWART FOTHERINGHAM of Fotheringham and Murthly, Murthly
 Castle, Perth.
 LORD FORTEVIOT, Dupplin Castle, Perth.
 Colonel Sir JOHN GILMOUR, Bart., M.P., D.S.O., of Montrave, Leven.
 The EARL OF HOME, Springhill, Coldstream.
 J. H. MILNE HOME, Irvine House, Canonbie.
 JAMES B. LUMSDEN of Arden, Dumbartonshire.

A. D. MACDONALD, Lennel, Coldstream.
 Sir KENNETH MACKENZIE of Gairloch, Bart., Canon House, Canon Bridge, Ross-shire.
 MACLAHLAN OF MACLAHLAN, Castle Lachlan, Strachur.
 JAMES M'QUEEN of Crofts, Dalbeattie.
 The Right Hon. Sir HERBERT E. MAXWELL of Monreith, Bart., Whauphill.
 LORD POLWARTH, Humble House, Upper Keith.
 Major MARK SPROT of Riddell, Lilliesleaf.
 The EARL OF STAIR, D.S.O., Lochinch, Castle Kennedy.
 Colonel ARCHIBALD STIELING of Keir, Dunblane.
 Sir JOHN MAXWELL STIELING MAXWELL of Pollok, Bart., Pollok House, Pollokshaw.
 Sir DAVID WILSON, Bart., D.Sc., of Carbeth, Killearn, Treasurer, *ex officio*.
 J. T. M'LAREN, The Leuchold, Dalmeny House, Edinburgh, Chairman, *ex officio*.

10. OFFICE-BEARERS.

Constitution: (1) The four Ordinary Directors for the district in which the Show for the year is to be held (with the exception of one retiring next year), (2) one Ordinary Director from each of the other Show districts; and (3) the Chairman of the Board, Hon. Secretary, and Treasurer, *ex officio*.

Borders . { DUNCAN M'LAREN of Fairnington, Roxburgh.
 Major ROBERT W. SHARPE of The Park, Earlston.
 JOHN ELLIOT, Balnakiel, Galashiels.
Edinburgh . G. BERTRAM SHIELDS, Dolphingstone, Tranent.
Aberdeen . FALCONER L. WALLACE of Candacraig and Balcairn, Strathtoun.
Stirling . J. ERNEST KERR of Haiviestoun, Dollar.
Dumfries . COLONEL F. J. CARRUTHERS of Dormont, Lockerbie.
Inverness . Captain JOHN MACGILLIVRAY of Calrossie, Nigg, Ross-shire.
Perth . JOHN STEWART of Struthers, J.P., Woodburne House, Ceres, Fife.
Glasgow . ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.
 J. T. M'LAREN, The Leuchold, Dalmeny House, Edinburgh, Chairman, *ex officio*.
 Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B., Ardgowan, Inverkip, Hon. Secretary, *ex officio*.
 Sir DAVID WILSON, Bart., D.Sc., of Carbeth, Killearn, Treasurer, *ex officio*.

REPRESENTATIVES ON OTHER BODIES.

National Agricultural Examination Board.

Colonel F. J. CARRUTHERS of Dormont, Lockerbie.
 J. T. M'LAREN, The Leuchold, Dalmeny House, Edinburgh.
 G. BERTRAM SHIELDS, Dolphingstone, Tranent.
 Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B., Ardgowan, Inverkip.
 Sir DAVID WILSON, Bart., D.Sc., of Carbeth, Killearn.
 JOHN STIRTON, *Secretary*, Highland and Agricultural Society.

Edinburgh and East of Scotland College of Agriculture.

JOHN STIRTON, *Secretary*, Highland and Agricultural Society.

West of Scotland Agricultural College.

Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B., Ardgowan, Inverkip.

Aberdeen and North of Scotland College of Agriculture.

Dr J. F. TOCHER, 41½ Union Street, Aberdeen.

Royal (Dick) Veterinary College.**Glasgow Veterinary College.**

JAMES R. LUMSDEN of Arden, Dumbartonshire.

Scottish Milk Records Association.

JOHN M'CAIG of Belmont, Stranraer.

ALEXANDER MURDOCH, East Hallside, Hallside, Lanarkshire.

Sir HUGH SHAW STEWART of Greenock and Blackhall, Bart., C.B.,
Ardgowan, Inverkip.

SCOTTISH PLANT REGISTRATION STATION.**Standing Committee of Management.**

Sir DAVID WILSON, Bart., D.Sc., of Carbeth, Killearn.

JAMES ELDER, Athelstaneford Mains, Drem.

G. BERTRAM SHIELDS, Dolphingstone, Tranent.

MEETINGS.

General Meetings.—By the Charter the Society must hold two General Meetings each year, and, under ordinary circumstances, they are held in the months of January and June, in the Society's Hall, 3 George IV. Bridge, for the election of Members and other business. Twenty a quorum.

By a resolution of the General Meeting on 15th January 1879, a General Meeting of Members is held in the Showyard on the occasion of the Annual Show. This year it will be held at Glasgow, on Wednesday, 15th July, at an hour to be announced in the programme of the Show.

With reference to motions at General Meetings, Bye-Law No. 10 provides—"That at General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision unless notice thereof has been given a week previously to the Board of Directors, without prejudice, however, to the competency of making such motion or proposal to the effect of its being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting."

General Show at Glasgow—14th, 15th, 16th, and 17th July.—Entries close for Implements, 27th April; Stock, Poultry, Dairy Produce, &c., 21st May; Honey, 11th June.

Directors' Meetings.—The Board of Directors meet (except when otherwise arranged) on the first Wednesday of each month from November till June inclusive, at half-past one o'clock P.M., and occasionally as business may require, on a requisition by three Directors to the Secretary, or on intimation by him. Seven a quorum.

Committee Meetings.—Meetings of the various Committees are held as required.

Nomination of Directors.—Meetings of Members, for the purpose of nominating Directors to represent the Show Divisions on the Board for the year 1926-1927, will be held at the places and on the days after mentioned :—

1. Edinburgh, Market Buildings, Gorgie, Wed., 27th Jan. 1926, at 1.
2. Glasgow, North British Railway Hotel, Wed., 10th Feb. 1926, at 1.
3. Stirling, Golden Lion Hotel, . . . Thur., 11th Feb. 1926, at 1.30.
4. Cupar, County Buildings, . . . Tues., 16th Feb. 1926, at 2.
(*In 1927 the Meeting will be held at Cupar; in 1928 and 1929 at Perth.*)
5. Border, Railway Hotel, St Boswells, . Thur., 18th Feb. 1926, at 1.
6. Aberdeen, Imperial Hotel, . . . Fri., 26th Feb. 1926, at 2.30.
7. Inverness, Station Hotel, . . . Tues., 2nd Mar. 1926, at 12.30.
8. Dumfries, King's Arms Hotel, . . . Wed., 10th Mar. 1926, at 1.

The nomination of Proprietor or other Member paying the higher subscription must be made in the 3rd, 6th, 7th, and 8th Divisions; and the nomination of Tenant-Farmer or other Member paying the lower subscription, in the 1st, 2nd, 4th, and 5th Divisions.

Retiring Directors are not eligible for re-election until after the lapse of at least one year.

EXAMINATIONS.

Agriculture.—The Examination for 1925 for the National Diploma in Agriculture will be held at the University, Leeds, on Wednesday, 15th April 1925, and following days. Entries close on 23rd February.

Dairy.—The Examination for 1925 for the National Diploma in Dairying will be held at the Dairy School, Kilmarnock, on Friday, 18th September, and following days. Entries close on 8th August.

Forestry.—The Examination for the Society's Certificates in Forestry will be held at 3 George IV. Bridge, Edinburgh, in the month of March 1926.

AGRICULTURAL EDUCATION

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

From 1858 to 1899 the Society held an annual Examination for Certificate and Diploma in Agriculture. In 1872 the Free Life Membership of the Society was granted to winners of the Diploma. In 1884 permission was given to holders of the Diploma to append the letters F.H.A.S. to their names.

In 1898 it was resolved by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland to discontinue the independent Examinations in Agriculture held by the two Societies, and to institute in their stead a Joint-Examination for a NATIONAL DIPLOMA IN AGRICULTURE (N.D.A.) This Examination is now conducted under the management of the "National Agricultural Examination Board" appointed by the two Societies. In the year 1903, on the invitation of the two Societies, the Ministry of Agriculture and Fisheries and the Scottish Education Department agreed to appoint a representative from each to act on the Examination Board. Sir Daniel Hall, K.C.B., represents the former, and Sir John Struthers, K.C.B., the latter body.

REGULATIONS FOR EXAMINATION IN THE SCIENCE AND PRACTICE OF AGRICULTURE

1. The Societies may hold conjointly, under the management of the National Agricultural Examination Board appointed by them, an Annual Examination in the Science and Practice of Agriculture, at a convenient centre.

2. Candidates who pass the Examination will receive the National Diploma in Agriculture—the Diploma to be distinguished shortly by the letters "N.D.A."

3. The Examination will be conducted by means of written papers and oral examinations.

4. In order to be eligible to sit for the Board's Examination in Agriculture, a candidate must—

(a) Present a certificate from a recognised Agricultural College that his attainments in the subjects of *General Botany, Geology, General Chemistry, Physics and Mechanics*, as attested by class and other examinations, are, in the opinion of the authorities of the College, such as to justify his admission to the Board's Examination; or

(b) Produce evidence that he has passed the 1st B.Sc. or the Intermediate Examination in Science of a British University; or

(c) Present a Senior Certificate obtained at the Local Examinations of the Universities of Oxford or Cambridge, and produce evidence that

he has continued his study of science for at least a year, and has obtained a certificate in Subject 3 (a) Elementary Chemistry and Physics, (b) Botany of Group H of the Oxford Higher Local Examination, or in Subjects 1, Elementary Chemistry and Physics, and 4, Botany of Group E of the Cambridge Higher Local Examination; or

(d) Present an Intermediate Leaving Certificate of the Scottish Education Department, and produce evidence that he has continued his studies for at least another year and has obtained the Higher Leaving Certificate in Science (including Chemistry and Botany).

5. In the case of students who satisfy the Board that they have not had the facilities for obtaining the foregoing certificates, the Board will be prepared to consider evidence of equivalent attainment. [Applications under this rule must be lodged three months before the date of the annual examination.]

6. *Before sitting for the PRACTICAL AGRICULTURE and FARM MACHINERY AND IMPLEMENTS papers, all candidates must produce evidence of possessing a practical knowledge of Agriculture obtained by residence on a farm for a period or periods (not more than two) covering a complete year of farming operations.*

7. Candidates will have the option of taking the whole of the following nine papers at one time, or of sitting for a group of any three, four, or five in one year and the remaining subjects within the next two years:—

SUBJECT.	Maximum Marks.	Pass Marks.
1. Practical Agriculture (First Paper)	400	240
2. Practical Agriculture (Second Paper)	400	240
3. *Farm Machinery and Implements	300	150
4. Land Surveying and Farm Buildings	100	50
5. Agricultural Chemistry	300	150
6. Agricultural Botany	200	100
7. Agricultural Book-keeping	200	100
8. Agricultural Zoology	200	100
9. *Veterinary Science	200	100
	<hr/> 2300	<hr/> 1230

* *In subsequent examinations it is proposed to raise the pass standard in these subjects.*

NOTE.—Candidates taking the Examination in two Groups of subjects are recommended to take Agricultural Chemistry and Agricultural Botany in the first group.

8. A candidate who obtains not less than three-fourths (1725) of the aggregate maximum marks (2300) in the entire Examination will receive the Diploma with Honours, provided that he obtains not less than three-fourths (600) of the maximum marks (800) in the two Practical Agriculture papers.

9. Candidates electing to take the entire Examination at one time and failing in not more than three subjects may appear for these subjects in the following year. Failure in more than three subjects will be regarded as failure in the whole Examination.

10. In the case of candidates electing to take the Examination papers in two groups—

(a) A candidate appearing for a group of three subjects and failing in a single subject may appear for that subject in the following year. Failure in more than one subject will be regarded as failure in the group.

(b) A candidate appearing for a group of four, five, or six subjects, and failing in not more than two subjects, may appear for those subjects in the following year. Failure in more than two subjects will be regarded as failure in the group.

11. Non-returnable fees must be paid by Candidates as follows :—

Entire Examination	Six guineas.
Group of Subjects	Three guineas.
Reappearance for any Subjects	10/6 per Subject.

12. The Board reserve the right to postpone, abandon, or in any way, or at any time, modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

The Examination will take place at the Leeds University on WEDNESDAY, APRIL 15th, 1925, and following days.

Forms of application for permission to sit at the Examination may be obtained from "The Secretary, Royal Agricultural Society of England, 16 Bedford Square, London, W.C. 1," or from "The Secretary, Highland and Agricultural Society of Scotland, 3 George IV. Bridge, Edinburgh," and must be returned duly filled up not later than MONDAY, FEBRUARY 23rd, 1925, when the Entries will close.

16 BEDFORD SQUARE, LONDON, W.C. 1,
December 1924.

SYLLABUS OF SUBJECTS OF EXAMINATION

PRACTICAL AGRICULTURE.

I.—FIRST PAPER.

1. *British Farming*.—Arable, stock-raising, dairying—Approximate areas covered by the different systems—Typical examples of each—Area in Great Britain under chief crops—Numbers of live stock—The recent history of agriculture—Short summary of agricultural returns.

2. *Climate*.—The effect of climate on farming practice—Rainfall—Temperature—Prevailing winds—Weather forecasts.

3. *Soils*.—The influence of geological formations on the systems of farming—Classification of soils—Character and composition—Suitability for cultivation—Reclamation—Drainage—Irrigation—Warping—Application of lime and marl—Bare fallows—Tillage—Subsoiling—Deep and thorough cultivation.

4. *Manures*.—The manures of the farm—The treatment of farmyard manure—The disposal of liquid manure and sewage—General manures—Special manures—Field trials of manures—The application of manures—Period of application and amounts used per acre—Unexhausted value of manures and feeding-stuffs.

5. *Crops*.—Wheat, barley, oats, rye, beans, peas, potatoes, turnips, swedes, mangolds, forage plants, hops, and other crops—Their adaptation to different soils and climates—Varieties—Selection of seed—Judging seeds—Cultivation, weeds and parasitic plants, best methods of prevention and eradication—Harvesting—Storing—Cost of production—Improvement of crops by selection and hybridising—Field trials—Methods which the farmer may adopt—Selection to resist disease—The principles of rotations—Rotations suitable for different soils and climates—Rotations and the maintenance of fertility—Green manuring—Leguminous crops in rotation—Catch crops—The advantages and disadvantages of rotations—Specialised farming—Management of Orchards.

II.—SECOND PAPER.

6. *Live Stock*.—The different breeds of British live stock—Their origin, characteristics, and comparative merits—Suitability for different districts—Breeding—General principles—Selection—Mating—Crossing—Rearing and general management—Breeding and rearing of horses, cattle, sheep, pigs, and poultry—Rearing colts and raising store stock—The foods of the farm—Their composition and suitability for different classes of stock—Purchased foods—Composition and special value—Rations for different kinds and ages of stock—Cost of producing beef, mutton, pork, and milk—Cost of feeding farm horses.

7. *The disposal of Crop, Produce, and Stock*.—Marketing grain and other crops—Sale of stock—Live weight—Dead weight.

8. *Milk*.—The production and treatment of milk—The manufacture of cheese, butter, &c.—The utilisation of by-products.

9. *Farming Capital*.—Calculations of the stocking and working of arable, stock, and dairy farms—Farm valuations—Rent and taxes.

10. *Labour*.—Organisation of labour—piece-work, time-work—labour costings.

11. *Renting a Farm*.—Indications of condition, productive power, and stock-carrying capacity—Leases—Conditions of occupancy.

N.B.—*It is essential that a Candidate know his subject practically, and that he satisfy the Examiner of his familiarity with farm work and management.*

III.—FARM MACHINERY AND IMPLEMENTS.

1. *Power*.—The principle of action, construction, method of working, also care and management of steam engines and boilers, gas, oil and petrol engines and agricultural tractors—Cost and working expenses in connection with the above—Estimation of the brake horse-power of engines—Power derived from water—Measurement of the quantity of water flowing in a stream—General arrangement of water-power plants—Water-wheels—Turbines—Pumps, principle of action and construction—Flow of water through pipes—Hydraulic ram—Windmills.

2. *Agricultural Implements and Machinery*.—The mode of action and the general principles involved in the construction and working of farm implements and machinery—Arrangement of machinery with respect to the power plant—Pulleys and belting—Shafting and bearings—Lubrication—Lifting appliances—Strength and care of chains—Concrete and its use in the construction of simple foundations for engines and machines.

3. *Implements of Cultivation*.—Ploughs—Cultivators—Grubbers—Harrows—Drills—Manure Distributors—Seeding and planting implements.

4. *Implements of Harvesting*.—Mowing and Reaping machines—Rakes—Tedders—Elevators—Potato raisers.

5. *Implements of Transit*.—Carts, waggons, rick lifters, tractors.

6. *Threshing and Food-preparing Machinery*.—Threshing machines, stationary and portable, Screen Winnowers—Hummelers, Chaff cutters—Pulpers—Cake breakers.

7. *Dairy Appliances*.—Milking machines—Cream separators—Churns and other butter-working appliances—Milk delivery cans—Cheese-making utensils—Vats and presses.

N.B.—*Candidates are expected to have had some experience with agricultural machinery and implements under actual working conditions, and to be capable of illustrating their answers, when necessary, by intelligible sketches or diagrams.*

IV.—LAND SURVEYING AND FARM BUILDINGS.

1. The use and adjustment of instruments employed in Surveying and Levelling other than the Theodolite.
2. Land surveying by chain—Plotting from field book, and determination of areas surveyed—The simpler "field problems."
3. Levelling and plotting from field book.
4. A knowledge of the various classes of maps published by the Ordnance Survey Department and their Scales.
5. *Roads and Fences*.—The construction and maintenance of farm roads, fences, and ditches.
6. *Land Drainage*.—Methods of draining; mole and pipe drains; cost of construction and maintenance.
7. *Buildings*.—Buildings required on different classes of farms—Economic arrangement of farm buildings—Materials—Construction—Ventilation—Drainage—Water supply—Dimensions of dairy, stables, cow-sheds, yard, courts, and piggeries—Accommodation for power—Implement, machinery, and cart sheds—Hay and grain sheds—Shelter sheds—Storage of manure.

N.B.—*Each candidate should have with him at the Examination a pair of compasses, scales of equal parts, including scales of one chain to the inch, 4 feet to the inch, 8 feet to the inch, and the scale fitting the Ordnance map, 11111 or 25'344 inches to the mile, a small protractor, a set square, and a straight-edge about 18 inches in length.*

V.—AGRICULTURAL CHEMISTRY.

1. *The Atmosphere*.—Its composition and relations to plant and animal life.
2. *Water*.—Rain water—Soil water and drainage—Drinking water—Sewage and irrigation.
3. *The Soil*.—Origin, formation, and classification of soils—Sampling—Analysis—Composition of soils—The chemical and physical properties of soils—The water and air of the soil—Biological changes in the soil—The soil in relation to plant growth—Fertility—Causes of infertility—Improvement of soils.
4. *Manures*.—Theories of manuring—Classification of manures—Origin, nature, and characteristics of manures—Manufacture of manures—Composition, analysis, adulteration, and valuation of manures—Farmyard manure and other natural manures—Green-manuring—Liming, marling, claying—Artificial manures, their origin and manufacture—Fertilisers and Feeding Stuffs Act—Sampling of manures.
5. *Poisons, Antiseptics, and Preservatives*.—General chemical composition and character of insecticides, fungicides, antiseptics, and preservatives used on the farm.
6. *Plants and Crops*.—Constituents of plants—Assimilation and nutrition of plants—Sources of the nitrogen and other constituents of plants—Germination—Action of enzymes—Composition and manurial requirements of farm crops—Food products derived from crops—Manuring experiments.
7. *Animals*.—Composition of animal body—Animal nutrition—Digestion—Assimilation, metabolism, respiration, and excretion.
8. *Foods and Feeding*.—Constituents of foods—Origin, nature, and composition of chief feeding-stuffs—Sampling, analysis, and adulteration of foods—Nutritive value and digestibility of food—Functions of chief

food constituents—Energy values—Vitamines—Relation of foods to the production of work, meat, milk, and manure—Manurial residues of foods.

9. *Dairy Chemistry*.—The composition of milk, cream, butter, cheese, &c.—Conditions which influence the composition of milk and milk products—Action of ferments and enzymes on milk and milk products—Milk-testing—Analysis and adulteration of dairy products.

N.B.—*Candidates are required to bring their Laboratory Notes to the Oral Examination in this subject.*

VI.—AGRICULTURAL BOTANY.

In addition to a *general knowledge* of the morphology, histology, and physiology of plants, candidates will be expected to possess a *detailed knowledge* of the following subjects:—

British grasses of agricultural importance: recognition of, at any stage of growth. Habitats of important species. Constitution of the grass flora of good meadows and pastures. Composition of seed mixtures for temporary and permanent leys on various soils. The effects of artificial manures on the flora of grass land.

The weeds of arable and grass land. Poisonous and parasitic weeds. Methods of distribution by seed and vegetatively: of eradication. Weeds as soil indicators. Recognition of the seeds of the common weeds, particularly those characteristically found in clover, grass, &c., seed.

The chief varieties of wheat, barley, oats, clovers, roots, and other farm crops: their suitability for various climatic and soil conditions. The identification of the more important types of cereals by means of their grain characters. Characteristics of good and bad samples of cereals.

Identification of materials used in feeding cakes and meals.

Plant-breeding. Principles of heredity in plants. Pure lines. Fluctuating variability. Selection.

Disease in plants. Diseases due to the attacks of parasitic fungi. Resistance to disease: conditions affecting. Fungoid diseases scheduled from time to time by the Ministry of Agriculture and Fisheries.

Yeasts and fermentation.

The general outlines of bacteriology: nitrogen fixation, nitrification, and denitrification. Putrefaction and the bacteriology of milk, butter, and cheese.

VII.—AGRICULTURAL BOOK-KEEPING.

Principles of book-keeping; single and double entry; opening books, description of subsidiary books, with examples of entries therein; the ledger; posting; preparation of trial balance; valuation of stocks and effects; closing and proving the books, preparation of profit and loss account and balance-sheet; ruling off accounts.

Application of special methods to farms of varying requirements.

VIII.—AGRICULTURAL ZOOLOGY.

1. The part played by common animals in helping or hindering agricultural operations, as illustrated by moles and voles, insectivorous and other birds, snails and slugs, useful and injurious insects, arachnids and myriapods, earthworms, &c.

2. *General Structure of Insects*, especially the external characters.

3. *Life-history of Insects*.—Economic importance of different stages. A knowledge of the life-history of the principal insect pests as affording a basis for appropriate treatment.

4. *Acarina* injurious to Food Crops and Live Stock.

5. *Parasitic Worms*.—Flukes, Tapeworms, and Threadworms.

6. *Preventives and Remedial Measures* in regard to insects, acarines, and worm parasites—e.g., farm practice in relation to the discouragement of insect attack. Encouragement of insect-eating birds and mammals. Artificial remedies. Insecticides. Treatment for parasites.

N.B.—*Practical acquaintance with common animals, especially insects and worm parasites, will be expected. Where the candidate is not acquainted with the scientific name of an animal, the generally received English name will be accepted.*

Candidates are required to bring their Laboratory Notes to the Oral Examination in this subject.

IX.—VETERINARY SCIENCE AND HYGIENE.

1. Elementary anatomy and physiology of the horse, ox, sheep, and pig, and their relation to unsoundness and disease.

2. The general principles of breeding—including the physiology of reproduction, the laws of heredity, the periods of gestation, and the signs of pregnancy in the mare, cow, ewe, and sow.

3. Dentition as a means of determining the age of horses, cattle, sheep, and swine.

4. The management of farm stock in health and disease.

The following won the Diploma in 1924 :—

Diploma, with Honours.

1st. RICHARD WALLACE THOMPSON, Harper Adams Agricultural College, Newport, Salop

2nd. OSCAR WILLIAM HENRY FARRAR, Harris Institute, Preston.

3rd. ABRAM BROADFOOT, Glasgow University and West of Scotland Agricultural College.

4th. AUSTEN STANSFIELD BARKER, University of Leeds.

Diploma.

DAVID THAIN ADAM, North of Scotland College of Agriculture, Aberdeen.

DONALD CLAUDE BOWER, Seale Hayne Agricultural College, Newton Abbot, Devon.

HUGH CALDERWOOD, West of Scotland Agricultural College, Glasgow.

RONALD HENRY CHALLAND, Midland Agricultural College, Sutton Bonington, Loughborough.

ROGER CLOUGH, Seale Hayne Agricultural College.

GORDON COWAN, West of Scotland Agricultural College.

JAMES TROUP DALLAS, University of Leeds.

GEORGE DUNLOP DAVIDSON, Glasgow University.

JOHN EVANS, University College of Wales, Aberystwyth.

ELIZABETH HELEN MARGARET FARRIES, West of Scotland Agricultural College.

KEVIN COLUMBA ALOYSIUS FITZGERALD, Seale Hayne Agricultural College.

LEONARD WALBANKE FURNESS, Midland Agricultural College.
 ALAN VERNON GIBBERD, University College, Reading.
 JOHN GILLIES, West of Scotland Agricultural College.
 CLAUDE LIONEL GODSON, South-Eastern Agricultural College, Wye, Kent.
 DAVID W. HENDERSON, West of Scotland Agricultural College.
 ROBERT GILCHRIST HOUSTON, West of Scotland Agricultural College.
 HARRY CANDLER HUNT, Seale Hayne Agricultural College.
 JOHN JARVIE, West of Scotland Agricultural College.
 ROBERT JOHNS, University College of Wales, Aberystwyth.
 ROBERT KINLOCH, East of Scotland College of Agriculture, Edinburgh.
 CLEMENT WHITWORTH LINLEY, University of Leeds.
 ROBERT HAMILTON LOHOAR, West of Scotland Agricultural College.
 JAMES LYMBURN, West of Scotland Agricultural College.
 ROBERT GORDON MACFARLANE, West of Scotland Agricultural College.
 ALEXANDER STEWART MCKINNON, West of Scotland Agricultural College.
 GAVIN MACNEILAGE, West of Scotland Agricultural College.
 ARCHIBALD MCVICAR, West of Scotland Agricultural College.
 THOMAS MAGUIRE, Royal College of Science, Dublin.
 WILLIAM EWART JOSÉ MILTON, University College of Wales.
 WILLIAM BEVERIDGE MORRIS, Edinburgh University and East of Scotland College of Agriculture.
 JOHN COCHRANE MUIR, Glasgow University and West of Scotland Agricultural College.
 WILLIAM ALEXANDER DONALD MURRAY, Seale Hayne Agricultural College.
 CEDRIC OWEN OATES, Seale Hayne Agricultural College.
 CLIFFORD DENT OXLEY, Seale Hayne Agricultural College.
 JOHN MOSLEY PECK, Midland Agricultural College.
 WILLIAM ALLAN PORTER, West of Scotland Agricultural College.
 FRANCIS ANDREW ROBB, Glasgow University.
 THOMAS HARVEY ROSE, Armstrong College, Newcastle-upon-Tyne.
 RICHARD ROUTLEDGE, University of Leeds.
 ARTHUR LESLIE STICKLAND, University College, Reading.
 STANLEY BOWSER SUMMERS, West of Scotland Agricultural College.
 WILLIAM EDWARD WATSON, Harper Adams Agricultural College.
 FRANK EDWARD WEAVER, University of Leeds.
 CHARLES ROBERT MATTHEW WEBB, Midland Agricultural College.
 FREDERICK CHARLES WHITE, University College, Reading.
 ERNEST AUGUSTUS GEORGE WIGGINS, Midland Agricultural College.
 GEORGE WALLACE WILKINSON, Midland Agricultural College.
 CECIL SAMUEL GILL WORTHINGTON, University of Leeds.

EXAMINATION PAPERS OF PAST YEARS.

Copies of the Papers set at the Annual Examination for the National Diploma in the Science and Practice of Agriculture held in 1921 may be had upon application. Price 6d. per set.

VETERINARY DEPARTMENT

The Society established a Veterinary Department in 1823, but by an arrangement made with the Royal College of Veterinary Surgeons, the Society's examination ceased in 1881. Holders of the Society's Veterinary Certificate are entitled to become Members of the Royal College of Veterinary Surgeons on payment of certain fees, without being required to undergo any further examination. The number of Students who passed for the Society's Certificate is 1183.

The Society votes annually eleven silver medals for Class Competition to each of the two Veterinary Colleges in Scotland, the one in Edinburgh and the other in Glasgow.

FORESTRY DEPARTMENT .

The Society grants FIRST and SECOND CLASS CERTIFICATES in FORESTRY.

1. An Examination will be held each year about the month of March.
2. The next Examination will be held at 3 George IV. Bridge, Edinburgh, on the 17th, 18th, and 19th March 1925, provided a sufficient number of candidates present themselves for examination.
3. Candidates must possess—1. A thorough acquaintance with the theory and practice of Forestry. 2. A general knowledge of the following branches of study, so far as these apply to Forestry: (a) The Elements of Botany and Forest Zoology; (b) The Elements of Physics, Chemistry, and Meteorology; (c) Forest Engineering, including Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to fencing, draining, bridging, road-making, and saw-mills; and Implements of Forestry; (d) Book-keeping and Accounts.
4. The examinations are open to candidates of any age, may be both written and oral, and will include such practical tests as may from time to time be decided to apply.
5. The maximum number of marks for each subject is 100; Pass marks for First-Class Certificate—Forestry, 75; all other subjects, 60. Pass marks for Second-Class Certificate—Forestry, 60; all other subjects, 50.
6. A candidate who obtains Pass marks in certain subjects, but fails in others, may come up for these other subjects alone, it being understood that without the special permission of the Society no candidate will be eligible to enter for more than two subsequent examinations.
7. A candidate who has obtained the Second-Class Certificate may enter again for the First-Class Certificate.

The list of students who obtained certificates prior to 1899 appears in the 'Transactions,' Fifth Series, vol. xi. (1899).

The following have since obtained First-Class Certificates:—

ERIC ARTHUR NOBBS, Department of Agriculture, Cape Town, . . .	1899
GEORGE POTTS, Grey College, Bloemfontein, Orange River Colony, . . .	1899
DUNCAN S. RABAGLIATI, 1 St Paul's Road, Bradford, . . .	1901
FRANK SCOTT, Dumfries House Mains, Cumnock, . . .	1903
WILLIAM T. STOCKLEY, Rose Villa, Garswood, near Wigan, . . .	1906
A. FRANK WILSON, C.D.A. (Edin.), Reedieleys, Auchtermuchty, . . .	1907
GEORGE FISHER, Farm Brook, Pilling, Garstang, Lancs., . . .	1909
JOHN PATTEN, jun., Hulne Park, Alnwick, . . .	1909
ALEXANDER MITCHELL, Dalmeny Park, Edinburgh, . . .	1909
JOHN D. DAVIDSON, Brimstage, Birkenhead, . . .	1911
DONALD DOULL, M.A., A.R.C.Sc., High School, Kelso, . . .	1911
JAMES W. MACKAY, Jervaulx Abbey, Middleham, Yorks., . . .	1915
HARRY WATSON, Darnaway, Forres, . . .	1915
REGINALD WATT HUNTER, 94 St George's Terrace, Newcastle-on-Tyne, . . .	1919
JOHN M'EWEN, Monaghty Forest, by Elgin . . .	1922
ALFRED POPE, Swinsty Hall, Fewston, Harrogate . . .	1922

The following have since obtained Second-Class Certificates:—

WILLIAM BRUCE, B.Sc., East of Scotland College of Agriculture, Edinburgh, . . .	1901
RAJAPPIER SWAMINATHAN, 56 Jesus Lane, Cambridge, . . .	1901
THOMAS USHER, Courthill, Hawick, . . .	1901
ALLAN CARRUTH, Lawmarnock, Kilbarchan, . . .	1905
ALEX. M. LUMSDEN, Newburn Schoolhouse, Upper Largo, . . .	1905
ROBERT M. WILSON, Laws Cottage, Duns, . . .	1905
THOMAS CAMPBELL, Greystoke, Penrith, . . .	1906
DONALD FERGUSON, Quarry Lane, Lennoxtown, . . .	1906
CHARLES PENRHYN ACKERS, Huntly Manor, Gloucester, . . .	1908
ROBERT HOWIE, Beechwood, Arbroath, . . .	1908
JOHN TROTTER, D.Sc., 22 West Savile Terrace, Edinburgh, . . .	1908
JAMES A. S. WATSON, Downieken, Dundee, . . .	1908
NORMAN H. PEARSON, 52 Percy Park, Tynemouth, . . .	1909
LIONEL F. STOHART, Royal Agricultural College, Cirencester, . . .	1911
ALEXANDER GEORGE NORRIE, Cairnhill, by Turriff, . . .	1913
WILLIAM WATT, Darnaway, Forres, . . .	1913
WILLIAM P. GREENFIELD, 6 Littlefield Lane, Grimsby, . . .	1915

SYLLABUS OF EXAMINATION

I.—SCIENCE OF FORESTRY AND PRACTICAL MANAGEMENT OF WOODS.

I. *Principles of Scientific Forestry*.—1. Effects of heat, light, moisture, and air-currents on forest vegetation. 2. Effects of depth, porosity, moisture, and chemical composition of the soil on forest vegetation. 3. Effects of forest vegetation on the soil and air. 4. Rate and extent of development, longevity, and reproductive power of trees. 5. Pure and mixed woods. 6. Systems of silviculture.

II. *Forest Organisation*.—7. General ideas regarding a regulated system of forest management. 8. Knowledge of working plans of forests.

III. *Practical Management of Woods*.—9. Draining and irrigation. 10. Choice of species for various situations. 11. Seed and sowing, including nurseries. 12. Planting. 13. Natural regeneration by seed, shoots, and suckers. 14. Formation of mixed woods. 15. Tending of young woods. 16. Pruning. 17. Thinning. 18. Sylvicultural characteristics of the principal trees.

IV. *Injuries by Storms and Fires*.—19. Storms. 20. Fires.

V. *Timber*.—21. Its technical properties. 22. Its defects. 23. Recognition of different kinds of timber. 24. Processes for increasing its durability.

VI. *Utilisation of Produce*.—25. Uses of wood and other produce. 26. Felling. 27. Conversion. 28. Seasoning. 29. Transport. 30. Sales. 31. Harvesting of bark.

II.—FOREST BOTANY AND FOREST ZOOLOGY.

(a) FOREST BOTANY.

The fundamental facts of morphology, physiology, and classification of plants. The structure and function of the plant-cell and the plant-tissues. Their primary distribution. The secondary changes they exhibit in consequence of perennation.

The structure and function of the root and shoot in flowering-plants. Buds, their forms and uses. The flower. The fruit. The seed.

The structure and function of vegetative and reproductive organs of fungi.

Relationship of plants to air, soil, and water. Effect of light, heat, and mechanical agencies upon plants. Nutrition. The nature and elements of the food of plants. Sources of plant-food. The absorption, elaboration, transference, and storage of food. Respiration and transpiration. Parasites and saprophytes. Symbiosis.

Growth of plants in length and thickness. Correlation of growth, pruning. Germination of seeds. Formation of wood and bark. Healing of wounds.

Diseases of plants due to faulty nutrition and unfavourable circumstances of growth. Diseases due to attacks of fungi.

Natural reproduction and propagation by seeds and by buds. Fertilisation of flowers. Hybridisation. Artificial propagation by budding, grafting, layering, and cutting.

The characters of the large groups and classes of the vegetable kingdom. The characters of the families of plants which include the chief timber trees. The botanical characteristics of the principal British forest-trees (including the structural features of their wood). The weeds of the forest and their significance.

(b) FOREST ZOOLOGY.

The group Insecta: its position in the animal kingdom. Structure, mode of reproduction and metamorphosis of insects. The outlines of classification of the group. Conditions favourable to the numerical increase of insects. Natural checks to increase (*e.g.*, birds, mammals, parasitic insects). The identification and life-history of the more important insects injurious to forest trees and fruit trees. The damage caused by these insect pests and their mode of attack. The damage caused by animals. Preventive and remedial measures.

III.—PHYSICS, CHEMISTRY, AND METEOROLOGY.

Physics.

Mass, weight, specific gravity, solid, liquid, and gaseous states of matter. Capillarity, osmose, vapour tension, suction pump, force pump, syphon, barometer, atmospheric pressure. Boyle's law. Levers and pulleys. Heat, measurement of heat, specific heat; transference of heat by conduction, convection, and radiation. Boiling and freezing. Latent heat. The thermometer. The conservation and transformation of energy. Light—reflection, refraction, polarisation; the spectrum. The rudiments of electricity and magnetism.

Chemistry.

Elements. Oxygen, hydrogen, nitrogen,—their preparation, properties, and chief compounds. Acids, bases, salts. Combustion, oxidation, reduction. Sulphur, carbon, phosphorus; and their compounds, with oxygen and hydrogen. Metals—potassium, sodium, calcium, magnesium, aluminium, iron, copper, lead, mercury, and their chief compounds. Carbohydrates, marsh gas, olefiant gas, alcohol, acetic acid, oxalic acid. Distillation of wood and coal.

Meteorology.

The atmosphere, its composition and physical properties. Measurement of pressure and temperature. The barometer. Rain, hail, snow, fog, cloud, dew, the dew-point, hoar frost. The weathering of rocks and soils. Gases injurious to vegetation.

IV.—FOREST ENGINEERING, INCLUDING LAND AND TIMBER MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, BRIDGING, ROAD-MAKING, AND SAW-MILLS.

1. The use of the level and measuring-chain. Measuring and mapping surface areas. 2. The measurement of solid bodies—as timber, stacked bark, fagots, &c., earthwork. 3. The different modes of fencing and enclosing plantations; their relative advantages, durability, cost of construction, and repairs. 4. The setting out and formation of roads for temporary or permanent use. 5. The construction of bridges over streams and gullies; of gates or other entrances. 6. The construction and working of estate saw-mills.

V.—ARITHMETIC—BOOK-KEEPING.

1. Arithmetic—including Practice, Proportion, and Decimal Fractions. 2. Book-keeping—including the description of books to be kept, and the solution of practical questions in Book-keeping and the preparation of Accounts.

EXAMINATION PAPERS, 1922.

PRACTICAL FORESTRY.

1. In a practically treeless hilly area, the planting of which you are entrusted with, explain the principles which would guide you in arriving at the limit of altitude for profitable tree-growth, considering generally the effect of latitude, aspect, wind, and soil (plantable soil being classed good, fair, and poor). State briefly the advantages of such a classification of soils.

2. Explain the method you would adopt in laying down the boundary line of an extensive plantation, assuming that the area to be planted is of a hilly and exposed nature.

State the type of fence you would recommend for the foregoing area for preventing sheep and ground-game from entering the plantation; and give a specification and an approximate cost per yard of its erection.

3. Compare the respective advantages and disadvantages of Spring and Autumn planting, and indicate under what conditions either season may be preferred.

What are, in your opinion, the most favourable spacing distances at which to plant trees? Choose any four species, and state the planting distances you would select for each, and state your reasons for the spacings you indicate.

4. Describe the kinds of soil and climatic conditions most favourable for the successful cultivation of the following: Oak, Ash, Larch, Douglas Fir, and Norway Spruce.

5. An estate with 2000 acres of timber is to be sold, and you are invited by the vendor to make a valuation of the timber. The timber is composed of 500 acres of mature wood of Oak, Ash, and Larch, 100 years of age; 500 acres of pure Scots Pine, 80 years of age; and 500 acres of pure Scots Pine from 30 to 40 years of age. There are also 500 acres of young plantations under 20 years of age. State how you would proceed to ascertain volume and value of the first three classes, and on what principle you would value the younger plantations. Give prices per cubic foot for the older timber.

6. At what stage in the life of a coniferous plantation should thinning operations be begun? and state the objects and benefits of thinning.

(Three hours allowed.)

FOREST BOTANY AND FOREST ZOOLOGY.

(4) FOREST BOTANY.

(Four questions only to be attempted.)

1. Describe the buds, flowers, and fruit of Elm, Alder, and Lime.

2. What is the general microscopic structure of the foliage leaf of such a tree as the Beech or Oak? In what essential ways does the

structure differ from that in the leaf of a Pine? Suggest reasons for the differences.

3. Write a life-history of the Fungus which causes "Dry-Rot." Suggest preventive measures.

4. Write a life-history of *Taxus baccata*.

5. Name and give characters for recognition of any three forest weeds known to you. State the harm each does.

(B) FOREST ZOOLOGY.

(Two questions only to be attempted.)

1. Describe by means of diagrams the nature of the brood-galleries of the Pine Beetle (*Myelophilus piniperda*), the Large Ash-Bark Beetle (*Hylesinus crenatus*), the Two-Toothed Pine Beetle (*Pityogenes* or *Tomicus bidentatus*).

2. Describe a Lepidopterous insect harmful to Larch or Pine under the headings:—

- (a) how recognised as adult,
- (b) how recognised as larva,
- (c) the nature of the damage,
- (d) treatment.

3. Name and distinguish four kinds of gall due to insects, and write an account of one of them, from origin to ripe condition.

(Two hours and a half allowed.)

PHYSICS, CHEMISTRY, AND METEOROLOGY.

1. State what is meant by the terms combustion, oxidation, and reduction, distinguishing between the last two. Under which of these heads would you classify the following chemical changes: phosphorus, copper, mercuric oxide, magnesium, heated in air?

2. What type of compound is produced when an element combines with oxygen? Into what groups may the elements be divided according to the properties of these compounds? State the general properties, distinguishing the elements of these groups.

3. Name the chief sources of *any three* of the following metals, and describe the extraction of the metal in *any one* case: sodium, calcium, iron, aluminium, lead, mercury.

4. Define the boiling-point of a liquid. If the boiling-point of a liquid is observed simultaneously at the foot and on the top of a mountain, state and explain any difference which would be noted.

5. Explain the formation of cloud and rain. What is understood by the "dew-point," and what is the purpose of determining it?

(An hour and a half allowed.)

FOREST ENGINEERING.

1. From the following level-book notes, with a datum line 25 feet below the ground-level at distance 0 :

- (a) Calculate and check the reduced levels.
- (b) Plot the section to a horizontal scale of 100 feet to an inch, and a vertical scale of 10 feet to an inch.
- (c) Indicate the direction of bottom line of drainage pipes, and find the slope of this line.

Rise.	D. S.	I. S.	F. S.	Fall.	Reduced level.	Distance in feet.	Remarks.
	14.54	12.63			25.00	—	B. M.
						0	⊙ A, bottom of drain-pipe is to be 2.05 feet below surface at ⊙ A.
		8.51				90	
		10.24				160	
	7.65		14.28			240	
		4.10				350	
		2.89				430	
		8.51				540	
		11.94				620	
			15.19			700	⊙ B, level of water of pond. Bottom of drain-pipe to be 1 foot above water-level.

2. Draw a rough sketch of a field from the following notes, and find its area in acres, &c.

3. Describe, with the aid of a diagram, how you would proceed to carry out the survey of a thick wood, where all the work must be done from the outside, and only a chain and poles are available.

4. A circular plantation is to be formed containing four acres. How many yards of fencing would be required to enclose it?

5. A ditch is to be 3 feet deep, $4\frac{1}{2}$ feet wide at the top, and $1\frac{1}{2}$ feet wide at the bottom; it is 120 rods in length, and the cost of excavating the soil is estimated at 6d. per cubic yard. What will be the total cost of the work?

6. How would you obtain the width of a river which is too broad for direct measurement? No instrument, other than a chain, is to be used.

Links.

	⊙ B	
	854	
210	721	
"	600	
	415	182
124	280	
	134	110
	⊙ A	

(Two hours allowed.)

ARITHMETIC AND BOOK-KEEPING.

I. ARITHMETIC.

1. Find the simple interest on £7665 for 35 days at 5 per cent.
2. What is the value of a piece of timber 5 feet 3 inches long, 2 feet 4 inches wide, and 1 foot 2 inches thick @ 10s. 6d. per cubic foot?
3. Find by practice the value of 3 cwt., 3 quarters, and 14 lbs. @ 8s. 4d. per ton.
4. A small wood, square in shape, has an area of 5625 square yards. It is to be fenced, and the fence is to be erected at a distance of 2 yards from the wood. How many yards of fencing are required?

II. BOOK-KEEPING.

Woodlands Estate has been recently purchased. A separate set of books is to be kept for each branch of the estate management by its supervisor, in which the details of all the transactions affecting the branch are to be recorded. At the end of the period these will be incorporated in the estate office books. You are in charge of one of the branches of the estate work.

1. State briefly—

- (1) What books you consider necessary properly to record your transactions.
- (2) What classes of accounts you expect it will be necessary to open in the ledger.
- (3) How at any given date you would satisfy yourself of the accuracy of your book-keeping.
- (4) How you would close your books at the end of the year.

Note—The transactions you have to record will be confined to purchases and sales, cash receipts and payments, including all expenses incidental to your department, and you will control a bank account.

2. Make the entries for the following transaction in the cash-book and the ledger.

1922.

Jan. 1.	Received from estate office	£150 0 0
" 2.	Paid into bank	120 0 0
" 2.	Ordered on credit from G. Toole, implements valued at	100 0 0
" 2.	Paid for books and stationery in cash	2 0 0
" 3.	Sold to S. Birch on credit 500 Scots pine @ 15s. each	
" 3.	Sold to D. Dick, and received payment, deadwood valued at	10 0 0
" 3.	Bought from F. Timber, young trees on credit	200 0 0
" 4.	Paid hire of horses used in haulage	5 0 0
" 6.	Received from S. Birch to account, and paid into bank	250 0 0
" 6.	Paid G. Toole in full by cheque, less 5 per cent discount	95 0 0
" 7.	Paid wages for week	8 0 0

3. How would you propose to keep trace of all implements purchased or acquired?

(One hour and a half allowed.)

DAIRY DEPARTMENT

EXAMINATION IN THE SCIENCE AND PRACTICE OF DAIRYING

This Examination, instituted in 1897, is conducted by the National Agricultural Examination Board, appointed jointly by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland.

REGULATIONS.

1. The Societies may hold annually in England and in Scotland, under the management of the National Agricultural Examination Board appointed by them, one or more Examinations for the National Diploma in the Science and Practice of Dairying; the Diploma to be distinguished shortly by the letters "N.D.D."
2. The Examinations will be held on dates and at places from time to time appointed and duly announced.
3. A non-returnable fee of *Three Guineas* will be required from each candidate.
4. Forms of Entry for the Examination in England may be obtained from "The Secretary, Royal Agricultural Society of England, 16 Bedford Square, London, W.C.1," and must be returned to him duly filled up, with the entry fee of £3, 3s., on or before Saturday, August 8, 1925.
5. Forms of Entry for the Examination in Scotland may be obtained from "The Secretary, Highland and Agricultural Society of Scotland, 3 George IV. Bridge, Edinburgh," and must be returned to him duly filled up, with the entry fee of £3, 3s., on or before Saturday, August 8, 1925.
6. A candidate may enter for Examination either in England or Scotland, but not in both, and a candidate who has once taken part in an Examination in England cannot enter for an Examination in Scotland, or *vice versa*.
7. As a preliminary to the acceptance of an application for permission to enter for the Examination, a candidate must produce:—
 - (1) A certificate testifying that he or she has received at least SIX session months' instruction (not necessarily continuous) in practical dairy work at an approved Dairy training institution.
 - (2) Evidence that he or she has spent at least SIX months on an approved Dairy farm (which period must not run concurrently with that referred to in sub-section 1), and that he or she has taken part in the work.
 - (3) Certificates in a prescribed form, from a recognised institution (or recognised institutions) showing that he or she has attended approved courses in Chemistry, Bacteriology, and Botany, and has satisfied the authorities of the institution of his (or her) fitness for admission to the Examination.
8. In the Examination a candidate will be required to satisfy the Examiners, by means of written papers, practical work, and *viva voce*, that he or she has—
 - (1) A general knowledge of the management of a Dairy Farm, including

the rearing and feeding of Dairy Stock, the candidate being required to satisfy the Examiners that he or she has had a thorough training and practical experience in all the details of Dairy work as pursued on a farm.

- (2) A thorough acquaintance, both practical and scientific, with everything connected with the management of a Dairy, and the manufacture of Butter and Cheese.
- (3) Practical skill in Dairying, to be tested by the making of Butter and Cheese.

NOTE.—A candidate must be prepared to make any one of the following varieties of Hard Pressed Cheese, the Examiner in Cheesemaking having the option of saying during the Examination what variety a candidate shall make:—

AT THE ENGLISH CENTRE—Cheddar, Cheshire, or Derby.

AT THE SCOTTISH CENTRE—Cheddar, Dunlop, or Cheshire.

- (4) Capacity for imparting instruction to others.

9. The maximum marks obtainable and the marks required for a pass in each subject are as follows:—

	Max.	Pass.
General Dairying Paper	200	120
Cheese-making Paper	200	120
Chemistry and Bacteriology Paper	200	120
Hard Pressed Cheese-making	200	150
Blue Veined Cheese-making	100	75
Soft Cheese-making	100	75
Butter-making	200	150
Capacity for imparting instruction to others	100	50
	<hr/> 1300	<hr/> 860

Honours will be awarded to candidates obtaining an aggregate of 80 per cent (1040) of the maximum marks (1300) in the examination, provided that they also obtain at least 80 per cent (320) of the maximum marks (400) in the General Dairying and Cheese-making Papers.

10. The Board reserve the right to postpone, to abandon, or in any way, or at any time, to modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

DATES OF EXAMINATIONS IN 1925.

ENGLAND—FRIDAY, September 4th, and following days, at the University College and British Dairy Institute, Reading; last date for receiving applications, SATURDAY, August 8th.

SCOTLAND—FRIDAY, September 18th, and following days, at the Dairy School for Scotland, Kilmarnock; last date for receiving applications, SATURDAY, August 8th.

SYLLABUS OF SUBJECTS OF EXAMINATION IN THE SCIENCE AND PRACTICE OF DAIRYING

I.—GENERAL MANAGEMENT OF A DAIRY FARM.

1. *General Management of Pastures and Crops on a Dairy Farm.*
2. *Buildings.*—Situation, Surroundings, Construction, Ventilation, and

Drainage of Farm Buildings. Suitability of building materials. Water supply. Construction and arrangement of Dairies: (a) for General Purposes; (b) for Special Purposes.

3. *Foods and Feeding*.—Summer and Winter Feeding of Dairy Cattle. Root crops. Green fodder. Ensilage. Different kinds of food and their composition. Their effect upon Milk, Butter, and Cheese. Special Foods used in Dairy Feeding. Preparation of food for Dairy Stock. Rearing and feeding of young Stock. Feeding and management of Pigs and Poultry.

4. *Dairy Cattle in Health and Disease*.—Characteristics of different Breeds and choice of Dairy Cattle. General functions of the organs of the animal body. Breeding. Parturition. Organs which secrete milk. Process of milk secretion. Changes which food undergoes during digestion. Diseases of Dairy Cattle and their remedies.

II.—MANAGEMENT OF DAIRY.

1. *Milk and Cream*.—Process of Milking. Dairy Utensils and Appliances, hand and power. Cooling of Milk. Separation and ripening of Cream. Different systems of Cream-raising. Utilisation of Skim-milk. Keeping of Milk. Importance of Cleanliness. Diseases spread by Milk. Conveyance and sale of Milk. Milk records. Keeping of Dairy and Farm Accounts. Creameries. Butter and Cheese Factories. Different systems of Dairying and their comparative returns.

2. *Butter*.—Churns and other Butter-making appliances, hand and power. Souring of Cream. Churning. Washing and working of Butter. Butter-milk. Packing and transmission of Butter. Salting and keeping of Butter. Colouring. Characteristics of good Butter.

3. *Cheese*.—Principles of its manufacture. Making of different kinds of Cheese (from cream, whole-milk, and skim-milk). Acidity of Milk. Use of Rennet and its substitutes. Whey. Appliances for Cheese-making. Ripening and storage of Cheese. Packing and sale of Cheese. Making of Cream and other soft Cheeses.

III.—CHEMISTRY AND BACTERIOLOGY.

[*N.B.*—In this Section there will be expected of the candidate a sound understanding of the scientific principles underlying the practice of Dairying, a knowledge of the composition, nature, properties, and changes undergone by the different substances met with in Dairying, and a general acquaintance with the principles of laboratory methods so far as Dairying is concerned, including the use of the microscope in identifying organisms.]

1. *General Principles of Chemistry*.—The nature of elements and compound bodies. The different forms of matter—solid, liquid, gaseous. Specific gravity, and instruments for determining it. Temperature, and methods of measuring it. Thermometric scales. The influence of temperature in Dairy operations. Physical and chemical changes involved in the following: solution, precipitation, filtration, distillation, oxidation, and reduction. Acids, Bases, Salts—their distinctive properties. Acidity and Alkalinity—their influence and quantitative estimation. Examination and identification of specimens and apparatus.

The Atmosphere—its constituents and impurities; its influence on Dairy operations. Atmospheric pressure.

Water—constituents of pure and natural waters. The impurities of water, and whence derived. The importance of a pure water supply in Dairying.

General knowledge of the elementary chemistry of the following substances and their compounds so far as met with in Dairying: Potash, Soda, Ammonia, Lime, Phosphoric Acid, Alcohol, Acetic Acid, Carbonic Acid, Butyric Acid, Lactic Acid, Albumen, Casein, Fats, Milk-sugar, Glycerine, Pepsin.

Saponification of Fats.

2. *Milk and its Products.*—The nature, composition, properties, and chemical constituents of milk. Microscopical appearances presented by milk. The circumstances that affect the quality and quantity of milk produced by the cow. The influence of feeding. The changes which occur in the keeping of milk, and how produced. The natural and artificial souring of milk. Rennet, its nature and use. Physical and chemical changes involved in the making and keeping of Butter, and in the manufacture and ripening of Cheese. Separated Milk, Condensed Milk, Fermented Milk. The use of Preservatives. Methods of Milk-testing—Mechanical methods, their theory and practice. A general knowledge of the methods employed in the chemical analysis of Milk and Butter. Adulteration of Milk, Cream, Butter, and Cheese—the ways in which adulteration is practised, the changes in composition thereby produced, and a general knowledge of the methods employed in detecting the same.

3. *The Chemistry of Feeding.*—The principal constituents of Food materials, and the functions they severally fulfil. The influence of Food constituents on milk production. Assimilation and Digestion. Animal Heat and Respiration. Milk as a Food. The relation of Food to Manure.

4. *Bacteriology.*—Moulds. Yeasts. Bacteria. The principal kinds of Bacteria met with in Dairying—their forms, methods of reproduction, and conditions of life. The influence of physical agencies upon Bacterial life. Air and Water as carriers of Bacteria. The changes produced by Bacteria in milk and its products. Useful forms and their functions. Harmful forms and their effects—Coagulation, Discoloration, Taints, &c. Pathogenic organisms. The classification of organisms—organised ferments and enzymes. The isolation of Bacteria. Methods of preparation of pure cultures and their practical use. Nutritive media. Soil Bacteriology—Assimilation of Nitrogen by Plants—Nitrification—Denitrification. Pasteurisation and Sterilisation—the practical application of these to Dairy matters. Fermentation and Putrefaction. Disinfectants and Preservatives.

N.B.—Candidates are required to bring their *Laboratory Notes* to the Oral Examination in this subject.

IV.—PRACTICAL SKILL IN DAIRY WORK.

Candidates must be prepared—(1) to produce at or before the Examination a satisfactory certificate of proficiency in the Milking of Cows, signed by a practical Dairy Farmer, and to satisfy the Examiners by a practical test, if so required; (2) to churn and make into Butter a measured quantity of Cream; and (3) to make one Cheese of each of the following varieties: (i) Hard-pressed, of not less than 30 lb. [*see Note to Regulation 8 (3)*]; (ii) Veined or blue-moulded, of not less than 10 lb.; and (iii) also to make one or other of the following Soft Cheeses: Cambridge, Camembert, Coulommier, or Pont l'Évêque.

V.—CAPACITY FOR IMPARTING INSTRUCTION TO OTHERS.

Candidates must also show practically that they are familiar with the management of a Dairy, and are capable of imparting instruction to others.

The following obtained the Diploma in Scotland in 1924 :—

Diploma with Honours.

1. ELIZABETH H. M. FARRIES, Risk, Castle-Douglas.
2. HARRY C. HUNT, 17 Copse Hill, Wimbledon, Surrey.
3. JANET L. STEWART, Southfield, Kirkmuirhill, Lanarkshire.
4. ALEXANDER S. MCKINNON, Tigh-na-Lynn, Lamlash.

Diploma.

JAMES E. BRUCE, 17 Braemar Street, Langside, Glasgow.
 CHRISTINA M. CAMPBELL, Craigroyston, Dalmally, Argyllshire.
 GEORGE D. DAVIDSON, Hayfield, Kirkpatrick-Fleming, by Lockerbie.
 KEVIN C. A. FITZGERALD, Seale Hayne Agricultural College, Newton Abbot.
 JOHN GILLIES, Levenvale, Half-way Tree, Jamaica, B.W.I.
 DAVID W. W. HENDERSON, "Blairmont," Carlisle.
 JOSEPH IRVING, Greenwrae, Greta, Dumfriesshire.
 JOHN JARVIE, "Ardenlea," Cumbernauld.
 ROBERT RUSSELL KAY, Beachmount, Stranraer.
 VIDA H. C. A. LAMB, 70 Mount Annan Drive, Cathcart.
 JOSEPH McCLEMON, 8 Barra Street, Maryhill, Glasgow.
 MATTHEW H. W. MILLER, "Raguel," Paisley.
 JOHN COCHRAN MUIR, 9 Gateside Place, Kilbarchan, Renfrewshire.
 HELEN McLAREN RAE, 48 Balshagray Avenue, Partick, Glasgow.
 M. Y. SELIM, Agricultural College, Giza, Egypt.
 THOMAS R. SHAXSON, "Little Mariners," Crickham Hill, Edenbridge, Kent.
 AGNES B. THORNLEY, 52 Buchanan Drive, Cambuslang.
 ROBERT TORRANCE, Jun., "Glen Rosa," Stewarton Drive, Cambuslang.
 CHARLES H. WESTWATER, Graham Place, Kinross.
 ESTHER ELAINE WOOD, New Malden, Surrey.
 ARCHIBALD D. WYLLIE, 11 Crompton Avenue, Cathcart, Glasgow.

The following obtained the Diploma in England in 1924 :—

Diploma with Honours.

1. ENID MARGUERITE HALLUM, British Dairy Institute, Reading.
2. DOROTHY CROWTHER-SMITH, British Dairy Institute.
3. HILDA MARY BALCH, British Dairy Institute.

Diploma.

OLIVE M. BARNARD, British Dairy Institute.
 VENA MARY BEBB, University College, Aberystwyth.
 ALFRED JOHN CARTER, East Anglian Institute of Agriculture, Chelmsford.
 NORAH J. CLARK, British Dairy Institute.

NORMAN DENNIS CLARKE, Midland Agricultural and Dairy College,
Sutton Bonington.
 NORMAN JOHN S. CLAY, British Dairy Institute.
 RICHARD LIONEL COATES, British Dairy Institute.
 H. GORDON COOK, British Dairy Institute.
 BETTY HAMILTON COX, British Dairy Institute.
 ESTHER ANN EVANS, University College, Aberystwyth.
 MARGERIE EVANS, Midland Agricultural and Dairy College.
 BARBARA MAUD ALICE FISCHER, British Dairy Institute.
 MABEL STAVELEY FOWLER, Lancs. C.C. Farm, Hutton, Preston.
 EDITH FRASER, Midland Agricultural and Dairy College.
 CHARLES ROY GREENWOOD, Harper Adams Agricultural College, and
British Dairy Institute.
 MARGARET HELEN HALL, Midland Agricultural and Dairy College.
 BERNARD HUGH HUNT, East Anglian Institute of Agriculture.
 WALTER G. JONES, British Dairy Institute.
 GEORGE WINSLOW LOCK, Midland Agricultural and Dairy College.
 ETHEL LUNT, Lancs. C.C. Farm, Hutton.
 ELEANOR FLORENCE McINTOSH, British Dairy Institute.
 MARION ADA MAXWELL, British Dairy Institute.
 DORIS ELIZABETH NAIISH, Midland Agricultural and Dairy College.
 GEORGE ALFRED MARTIN REED, East Anglian Institute of Agriculture.
 JANET ROBISON LEDINGHAM RENNIE, British Dairy Institute.
 MARGARET FORBES ROBINSON, British Dairy Institute.
 WILLIAM ROSS, British Dairy Institute.
 ROBERT MELVILLE STEDMAN ROUTLEDGE, Leeds University and Mid-
land Agricultural and Dairy College.
 GLADYS MARY ROWLING, British Dairy Institute.
 MARY ARDEN SHAKESPEARE, British Dairy Institute.
 PHYLLIS STEWART, Lancs. C.C. Farm, Hutton.
 ARTHUR LESLIE STICKLAND, British Dairy Institute.
 AVERIL STIRLING, Studley Agricultural College, Warwickshire.
 MARJORIE STITCH, Lancs. C.C. Farm, Hutton.
 HILDA MARY TURNER, Midland Agricultural and Dairy College.
 CECIL S. G. WORTHINGTON, Leeds University and Midland College.
 MARY WITTING, Lancs. C.C. Farm, Hutton.
 GLADYS MARGARET WOODS, British Dairy Institute.

EXAMINATION PAPERS OF PAST YEARS.

Copies of papers set at past Examinations in Agriculture and in Dairying
so far as available may be had on application. Price 6d. per set.

[N.D.A. Papers available are those for the years 1905, 1906, 1909, 1921,
1922, 1923, 1924.]

Note to Members sending Samples for Analysis.

The Directors are anxious to take any steps in their power to expose the vendors of inferior fertilisers and feeding-stuffs, and the members can give them assistance in this by supplying to the chemist, when sending samples for analyses, information as to the guarantee, if any, on which the goods were sold, and also as to the price charged.

These charges apply only to analyses made for agricultural purposes, and for the sole and private use of members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

Valuations of manures, according to the Society's scale of units, will be supplied if requested.

DAIRY PRODUCE.

Milk, full analysis,	£0 10 0
" solids and fat,	0 5 0
" fat only,	0 2 6

(Not more than six samples of milk per annum will be analysed at these rates for any one member.)

Butter, full analysis,	0 10 0
" partial analysis (water and fat),	0 5 0
Cheese,	0 10 0

WATER.

Analysis of water ¹ to determine purity and fitness for domestic use (the Committee reserve power to refuse from one member more than two samples annually at the reduced fee).....at the reduced fee of	1 0 0
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MISCELLANEOUS.

Search for poisons in food or viscera,	2 0 0
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(Veterinary surgeons are not entitled to have searches made for poisons in food or viscera at above rate for clients who are not members of the Society.)

Sulphate of copper, percentage of copper and purity,	0 5 0
" " complete analysis,	0 10 0
Arsenic, carbolic acid and tar acids, and other poisons used in making sheep dips, insecticides, &c.,	5s. to £1

Samples should be sent (carriage paid) to Dr J. F. Tocher, Crown Mansions, 41½ Union Street, Aberdeen.

INSTRUCTIONS FOR SELECTING SAMPLES FOR ANALYSIS.

MANURES.

Any method of sampling mutually agreed upon between buyer and seller may be adopted, but the following method is recommended as a very complete and satisfactory one: Four or more bags should be selected for sampling. Each bag is to be emptied out separately on a clean floor, worked through with the spade, and one spadeful taken out and set aside. The four or more spadefuls thus set aside are to be mixed together until a uniform mixture is obtained. Of this mixture one spadeful is to be taken, spread on paper, and still more thoroughly mixed, any lumps which it may contain being broken down with the hand. Of this mixture two samples of about half a pound each should be taken by the purchaser or his agent, in the presence of the seller or his agent or two witnesses (due

¹ Cases containing bottles for water samples and instructions for sampling are sent from the laboratory on application.

notice having been given to the seller of the time and place of sampling), and these samples should be taken as quickly as possible, and put into bottles or tin cases to prevent loss of moisture, and having been labelled, should be sealed by the samplers—one or more samples to be retained by the purchaser, and one to be sent to the chemist for analysis.

FEEDING-STUFFS.

Samples of feeding-stuffs which are in the form of meal may be taken in a similar manner.

Samples of cake should be taken by selecting four or more cakes from the bulk. These should be nudded to a size not larger than walnuts. The nudded cake should then be thoroughly mixed and samples of not less than one pound each taken from it. The samples should be put into bottles or tins, sealed up, and labelled. One sample should be sent to the analyst, and one or more duplicates retained by the purchaser.

SOILS.

Dig a little trench about two feet deep, exposing the soil and subsoil. Cut from the side of this trench vertical scrapings of the soil down to the top of the subsoil. Catch these on a clean board, and collect in this manner two pounds of soil taken from the whole surface of the section. Similar scrapings of subsoil immediately below should be taken and preserved separately. Five or six similarly drawn samples at least should be taken from different parts of the field, and kept separate while being sent to the chemist, that he may examine them individually before mixing in the laboratory.

VEGETABLE PRODUCTS.

Turnips, &c., at least 50 bulbs carefully selected as of fair average growth.

Hay, straw, ensilage, &c., should be sampled from a thin section cut across the whole stack or silo, and carefully mixed; above 2 lb. weight is required for analysis.

Grain should be sampled like manures.

DAIRY PRODUCE.

Milk.—Samples of milk from individual cows should be taken direct from the milk-pail after complete milking. Average samples from a number of cows should be taken immediately after milking. Specify whether the sample is morning or evening milk, or a mixture of these. Samples to be tested for adulteration should not be drawn from the bottom or taken from the top of standing milk, but they should be ladled from the vessel after the milk has been thoroughly mixed. Samples of milk should be sent immediately to the analyst.

For most purposes a half-pint bottle of milk is a large enough sample

Butter and Cheese.—About quarter-pound samples are required.

WATERS.

When the water is from a well, it should be pumped for some minutes before taking the sample.

If the well has been standing unused for a long time, it should be pumped for some hours, so that the water may be renewed as far as possible.

If the well has been newly dug or cleaned out, it should be pumped as dry as possible, daily, for a week before taking the sample.

Water from cisterns, tanks, ponds, &c., should be sampled by immersing the bottle entirely under the water, and holding it, neck upwards, some inches below the surface. *Water from the surface should not be allowed to enter the bottle.*

Spring or stream water should not be sampled in very wet weather, but when the water is in ordinary condition. Such waters should be sampled by immersing the bottle, if possible; but if not deep enough for that purpose, a perfectly clean cup should be used for transferring the water to the bottle.

When the bottle has been filled the stopper should be rinsed in the water before replacing it.

Interference with or disturbance of wells or springs, or the ground in their immediate vicinity, must be carefully avoided during sampling, and for at least twenty-four hours before it.

After a sample has been taken, it should be sent to the laboratory as speedily as possible.

A description of the source and circumstances of the water should accompany the sample, as the interpretation of the analytical results depends to some extent on a knowledge of such particulars.

N.B.—Stone jars and old wine bottles are unsuitable for conveying samples. Winchester quarts chemically cleaned should be obtained from the laboratory, Crown Mansions, 41½ Union Street, Aberdeen.

LOCAL ANALYTICAL ASSOCIATIONS.

With the view of encouraging, as well as regulating the conduct of, Local Analytical Associations, the Society, from 1881 to 1893, contributed from its funds towards their expenses a sum not exceeding £250 annually. In view of the passing of the Fertilisers and Feeding Stuffs Act, 1893, it was decided, at a meeting of the Directors on the 6th of December 1893, to discontinue that grant after the 1st of March 1894.

COMPOSITION AND CHARACTERISTICS OF MANURES AND FEEDING-STUFFS.

(See 'Transactions,' Fifth Series, vol. xi., 1899.)

FORMS OF GUARANTEE

GUARANTEE OF MANURE.

I guarantee that the manure called.....and sold by me to
.....contains—

<i>Soluble phosphoric acid</i>	=Phosphate of lime dissolved	per cent.
<i>Insoluble phosphoric acid</i>	=Phosphate of lime undissolved	per cent.
<i>Potash salts</i>	=Potash (K_2O)	per cent.
<i>Total nitrogen</i>	. . . . .	per cent.

Signature of seller.....

Date.....19...

GUARANTEE OF FEEDING-STUFF.

I guarantee that the feeding-stuff called.....and sold by me to
.....contains—

..... per cent albuminoids.
..... per cent oil.

Signature of seller.....

Date.....19...

PRICES OF FERTILISERS AND FEEDING STUFFS FOR SEASON 1925.

(Cash Prices as fixed on 4th February. These prices are subject to variation from month to month or oftener).

SUPERPHOSPHATES.

ITEM TO BE VALUED.	PRICES PER UNIT FOR THE UNDERNOTED PERCENTAGES.		
	30 per cent.	35 per cent.	38 per cent.
February Price	£3 7 6	£3 13 9	£4 0 0
Price per Unit	2/3	2/1½	2/1½

N.B.—These units are based on the RETAIL CASH PRICES OF MANURES in bags at Leith and Glasgow. When these units are multiplied by the percentages in the analysis of a Manure, they will produce a value representing very nearly the cash price per ton at which TWO TONS may be bought in fine sowing condition at Leith or Glasgow. Larger purchases may be made on more favourable terms.

FERTILISERS.

(Other than Superphosphates.)

Name of Fertiliser.	Guarantee.	Price per Ton.	Price per Unit.
Sulphate of Ammonia *	20·7 % Nitrogen	£ 13 0 0	£ 0 13 0
" " neutral *	21·1 % Nitrogen	14 12 0	0 13 10½
Basic Slag	22 % Total Phosphate	2 6 6	0 2 1½
" " " " " " " " " " " "	30 % " " "	3 0 0	0 3 0
" " " " " " " " " " " "	40 % " " "	3 10 0	0 1 9
Bone Meal, Home	4 Nit. 45 % "	9 0 0	N 0 19
Indian	4 " 45 % "	9 0 0	P 0 2 3
Steamed Bone Flour	½ " 60 % "	6 5 0	N 0 16
Ground Mineral Phosphate †	56 %	2 10 0	P 0 1 10½
" " " " " " " " " " " "	75 %	3 15 0	0 0 10½
Nitrate of Soda	15·5 % Nitrogen	13 10 0	0 17 5½
Lime †	18·0 %	12 12 6½	0 19 5
Potash Salt	30·0 % Potash	4 0 0	0 2 8
" " " " " " " " " " " "	20·0 % "	2 17 6	0 2 10½
Kainit	14·0 % "	2 10 0	0 8 7
Muriate of Potash	50·0 % "	7 10 0	0 8 0
Sulphate of Potash	50·0 % "	11 10 0	0 4 7½

The prices for all fertilisers are cash prices for two-ton lots at Leith or Glasgow, unless otherwise stated.

* Carriage paid to any railway station in four-ton lots. The price for March, April, and May is 2/- per ton more than February price.

† 80 per cent through 100 meshes to the linear inch; 5/- extra for 80 per cent through 120 meshes.

‡ Free on rail ex ship.

Note on Slags.—Ground Basic Slag will be delivered, carriage paid, in four-ton lots and upwards to any station in the following counties:—Slag containing 22 per cent Tricalcium Phosphate—Ayrshire and Renfrewshire, 44/6; Dumbarton, 45/6; Lanark, Edinburgh, Stirling, Linlithgow, Perth, 46/6; Fife and Kinross, 48/-; Peebles and Dumfries, 48/6; Wigtown, 49/-; Kirkcubright, 49/6; Forfar, 51/6. The prices for Slag containing 30 per cent Tricalcium Phosphate vary from 58/- in Ayrshire and Renfrewshire, to 65/- in Forfarshire. The terms are net cash one month.

FEEDING STUFFS.

Name of Feeding Stuff.	Price per Ton.	Name of Feeding Stuff.	Price per Ton.
	£ s. d.		£ s. d.
Linseed Cake (Home)	18 5 0	Dried Distillery Grains	10 0 0
Cotton Seed Cake (Bombay)	7 15 0	Peas Mutter	8 0 0
Cotton Seed Cake (Egyptian)	9 5 0	Peas Gram	11 0 0
Decorticated Ground Nut Cake	18 5 0	Feeding Treacle	9 5 0
Undecorticated Ground Nut Cake	11 0 0	Locust Beans (Kibbled)	8 15 0
Palm Kernel Cake	10 0 0	Maize (Flat)	10 5 0
Decorticated Cotton Seed Meal	11 10 0	Maize (Round Plate)	11 10 0
Rice Bran Meal	8 10 0	Beans (Imported China)	11 10 0
Bran (Medium Offals)	9 10 0	Home Oats	10 0 0
Farings (Fine Offals)	10 10 0	White Fish Meal	19 10 0
Dried Brewers' Grains	9 5 0		

CLASSIFICATION OF MANURES.

BONE MEALS	{	Genuine Bone Meal contains at least 45 per cent Tricalcium Phosphate, and from 2·75 per cent to 4 per cent Nitrogen. If phosphates are low nitrogen will be high, and conversely. If Bone Meal is so finely ground that 90 per cent or over passes a sieve of $\frac{1}{8}$ -inch mesh, an addition of 2/6 per ton should be made to the Valuation.
STEAMED BONE FLOUR	{	Ground to flour, and containing about 60 to 65 per cent Phosphates and about 1 to 1½ per cent Nitrogen.
MIXTURES AND COMPOUND MANURES	{	To be valued according to the following units: Nitrogen, 15/-; Soluble Phosphate, 2/3; Insoluble Phosphate, 1/3; and Potash, 3/6. The value given is exclusive of mixing, bags, and bagging, and is the value at Leith or Glasgow.
DISSOLVED BONES	{	Must be pure—i.e., containing nothing but natural bones and sulphuric acid.

INSTRUCTIONS FOR VALUING MANURES.

The unit used for the valuation of manures is the hundredth part of a ton, and as the results of analyses of manures are expressed in parts per hundred, the percentage of any ingredient of a manure when multiplied by the price of the unit of that ingredient represents the value of the quantity of it contained in a ton.

As an example take muriate of potash; a good sample (see p. 40) will be guaranteed to contain 50 per cent of oxide of potash. All potash manures are valued according to the amount of potash (oxide of potash) they yield, and muriate of potash yields 50 per cent potash (K_2O)—i.e., 50 units per ton; and as a ton of muriate of potash costs £7, 10s., the price of the unit is the fiftieth part of that—viz., 3/-. If on analysis a sample of muriate of potash guaranteed to contain 51 per cent of potash is found to contain only 49 per cent, the price per ton will be 3/- less—viz., £7, 7s.

Similarly with all other manures, the price per unit is derived from the price per ton of a sample of good material up to its guarantee, and

therefore the proper price per ton of a manure is found by multiplying the price of the unit of the valuable ingredient by the percentage as found by analysis. If a manure contains more than one valuable ingredient, the unit value of each ingredient is multiplied by its percentage, and the values so found when added together give approximately the price per ton of the manure.

Nitrate of soda contains no ammonia, but it contains nitrogen, and 14 units of nitrogen are equivalent to 17 units of ammonia.

The commercial values of manures are determined by means of the UNITS in the following manner:—

Take the results of analysis of the manure, and look for the following substances:—

Phosphates dissolved (or soluble phosphate)

Phosphates undissolved (or insoluble phosphate)

Total phosphates

Nitrogen

Potash

No other items but these are to be valued.

Should the results of analysis or the guarantee not be expressed in that way, the chemist or the seller should be asked to state the quantities in these terms.

Suppose the manure is ground mineral phosphate—

The proportion of phosphate present may be 75 per cent. The price per unit of phosphate in ground mineral phosphate is 1/-. The value of ground mineral phosphate containing 75 per cent phosphate is therefore 75 times 1/-, equal to £3, 15s. per ton.

Suppose the manure is a superphosphate—say an ordinary superphosphate with 35 per cent soluble phosphate,—the price per unit of phosphate in superphosphate is 2/1½. It is valued thus—

Soluble phosphate. 35 times 2/1½, equal to, say, £3, 13s. 8d.

Insoluble phosphate is not valued in a superphosphate.

Suppose the manure is a compound fertiliser containing 3 per cent nitrogen; 12 per cent soluble phosphate; 6 per cent insoluble phosphate; and 4 per cent potash.

The value of the nitrogen will be 3 times 15/- = £2 5 0 per ton.

“ “ soluble phosphate “ 12 “ 2/3 = 1 7 0 “

“ “ insoluble “ 6 “ 1/3 = 0 7 6 “

“ “ potash “ 4 “ 3/6 = 0 14 0 “

£4 13 6

The value of this manure will thus be £4, 13s. 6d. per ton, exclusive of the cost of mixing, bags, and bagging.

Notes.—The units have reference solely to the MARKET PRICES of Manures, and not to their AGRICULTURAL VALUES.

TABLE OF COMPENSATION VALUES FOR 1925.

TABLE SHOWING THE VALUE OF FEEDING-STUFFS AS MANURE PER TON, AND THE COMPENSATION VALUE PER TON OF FOOD CONSUMED, BASED ON THE AVERAGE UNIT PRICES OF FERTILISERS FOR 1925.

The following is a Table showing (under Section A) the average proportions of digested nitrogen, undigested nitrogen, phosphoric acid, and potash present in the feeding-stuffs named. The Table also shows the value per unit of nitrogen (digested and undigested), phosphoric acid, and potash, the prices per unit being the average value per unit prevailing for 1925. Under Section B of the Table is shown the compensation value per ton of food consumed for each of the feeding-stuffs named, based on the unit prices for 1925. Column (1) of Section B of the Table shows the value per ton recovered in dung; Col. (2) of the same section shows the value of the lasting part of dung per ton; while the remaining three columns show the residual values per ton after one crop, two crops, and three crops have been removed.

In accordance with the decision arrived at by the Committee appointed by a representative meeting of Scottish agriculturists, who reported in September 1917 on the "Compensation for Manurial Improvements and Cumulative Fertility," under the Agricultural Holdings (Scotland) Act, 1908, the value of undigested nitrogen per ton as manure is calculated as being 70 per cent of the value of digested nitrogen. The residual value, after one crop has been removed, is taken as one-half of the original residual value. Residual values, after one crop has been removed, are reduced by one-half after each crop.

FOODS.	VALUE PER					
	Digested Nitrogen.			Undigested Nitrogen.		
	Per cent in food.	Value at 15s. 8d. per unit.	Two-fifths value to manure.	Per cent in food.	* Value at 10s. 8d. per unit.	Three-fourths value to manure.
	(1)	(2)	(3)	(4)	(5)	(6)
		s. d.	s. d.		s. d.	s. d.
Cotton-cake, decorticated	5.92	90 3	36 1	0.98	10 5	7 10
Cotton-cake, undecorticated	2.73	41 8	16 8	0.81	8 8	6 6
Linseed-cake	4.08	62 3	24 11	0.67	7 2	5 5
Linseed	3.28	50 0	20 0	0.32	8 5	2 7
Soya-bean cake	6.10	93 0	37 2	0.75	8 0	6 0
Palm-nut cake	1.88	28 8	11 6	0.62	6 7	4 11
Cocoa-nut cake	2.65	40 5	16 2	0.75	8 0	6 0
Earth-nut cake	6.86	104 7	41 10	0.76	8 1	6 1
Rape cake	3.97	60 7	24 3	0.93	9 11	7 5
Beans	3.48	53 1	21 3	0.52	5 7	4 2
Peas	3.10	47 3	18 11	0.50	5 4	4 0
Wheat	1.49	22 9	9 1	0.31	8 4	2 6
Barley	1.16	17 8	7 1	0.49	5 3	3 11
Oats	1.52	23 2	9 3	0.48	5 1	3 10
Maize	1.22	18 7	7 5	0.48	5 1	3 10
Rice-meal	1.08	16 6	6 7	0.82	8 9	6 7
Locust beans	0.82	12 6	5 0	0.38	4 1	3 1
Malt	1.34	20 5	8 2	0.36	3 10	2 11
Malt culms	3.12	47 7	19 0	0.78	8 4	6 3
Bran	1.98	30 2	12 1	0.52	5 7	4 2
Brewers' and distillers' grains (dried)	2.34	35 8	14 3	0.96	10 3	7 8
Brewers' and distillers' grains (wet)	0.59	9 0	3 7	0.22	2 4	1 9
Dried distillery dreg	3.45	52 7	21 0	1.86	19 10	14 11
Clover hay	1.21	18 5	7 4	1.03	11 0	8 3
Meadow hay	0.88	13 5	5 4	0.62	6 7	4 11
Wheat straw	0.02	0 4	0 2	0.43	4 7	3 5
Barley straw	0.10	1 6	0 7	0.30	3 2	2 5
Oat straw	0.17	2 7	1 0	0.33	3 6	2 8
Mangolds	0.15	2 3	0 11	0.07	0 9	0 7
Swedes	0.16	2 5	1 0	0.09	1 0	0 9
Turnips	0.13	2 0	0 10	0.05	0 6	0 5
Fish-meal	8.08	123 3	49 4	0.90	9 7	7 2

See last paragraph of explanatory note to the Table.

A.						B.					
TON AS MANURE.						COMPENSATION VALUE PER TON OF FOOD CONSUMED.					
Phosphoric Acid.			Potash.			†	†	Residual Value after.			
Per cent in food	Value at 4s. 6d. per unit.	Three-fourths value to manure.	Per cent in food.	Value at 3s. 6d. per unit.	Three-fourths value to manure.	Values covered in dung.	Value of lasting part of dung.	* (3) One crop.	* (4) Two crops.	* (5) Three crops.	
(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	
	s. d.	s. d.		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	
8.10	13 11	10 5	2.00	7 0	5 3	59 7	23 6	11 9	5 10	2 11	
2.00	9 0	6 9	2.00	7 0	5 3	35 2	18 6	9 3	4 7	2 3	
2.00	9 0	6 9	1.40	4 11	3 8	40 9	15 10	7 11	3 11	1 11	
1.54	6 11	5 2	1.37	4 10	3 7	31 4	11 4	5 8	2 10	1 5	
1.30	5 10	4 5	2.20	7 8	5 9	53 4	16 2	8 1	4 0	2 0	
1.20	5 3	3 11	0.50	1 9	1 4	21 8	10 2	5 1	2 6	1 3	
1.40	6 4	4 9	2.00	7 0	5 3	32 2	16 0	8 0	4 0	2 0	
2.00	9 0	6 9	1.50	5 3	3 11	58 7	18 9	8 5	4 2	2 1	
2.50	11 3	8 5	1.50	5 3	3 11	44 0	19 9	9 10	4 11	2 5	
1.10	4 11	3 8	1.30	4 7	3 5	32 6	11 3	5 7	2 9	1 4	
0.85	3 10	2 11	0.96	3 4	2 6	23 4	9 5	4 8	2 4	1 2	
0.85	3 10	2 11	0.53	1 10	1 4	15 10	6 9	3 5	1 8	0 10	
0.75	3 4	2 6	0.55	1 11	1 5	14 11	7 10	3 11	1 11	0 11	
0.60	2 8	2 0	0.50	1 9	1 4	16 5	7 2	3 7	1 9	0 10	
0.60	2 8	2 0	0.37	1 4	1 0	14 3	6 10	3 5	1 8	0 10	
0.60	2 8	2 0	0.37	1 4	1 0	16 2	9 7	4 9	2 4	1 2	
0.80	3 7	2 8	0.80	2 10	2 1	12 10	7 10	3 11	1 11	0 11	
0.80	3 7	2 8	0.60	2 1	1 7	15 4	7 2	3 7	1 9	0 10	
2.00	9 0	6 9	2.00	7 0	5 3	37 3	18 3	9 1	4 6	2 3	
2.70	12 2	9 2	1.45	5 1	3 10	29 3	17 2	8 7	4 3	2 1	
1.61	7 3	5 5	0.20	0 8	0 6	27 10	13 7	6 9	3 4	1 8	
0.42	1 11	1 5	0.05	0 2	0 1	6 10	3 3	1 7	0 9	0 4	
0.44	2 0	1 6	0.22	0 9	0 7	38 0	17 0	8 6	4 3	2 1	
0.57	2 7	1 11	1.50	5 3	3 11	21 5	14 1	7 0	3 6	1 9	
0.40	1 10	1 5	1.60	5 7	4 2	15 10	10 6	5 3	2 7	1 3	
0.24	1 1	0 10	0.80	2 10	2 1	6 6	6 4	3 2	1 7	0 9	
0.18	0 10	0 8	1.00	3 6	2 7	6 3	5 8	2 10	1 5	0 8	
0.24	1 1	0 10	1.00	3 6	2 7	7 1	6 1	3 0	1 6	0 9	
0.07	0 4	0 3	0.40	1 5	1 1	2 10	1 11	0 11	0 5	0 2	
0.06	0 3	0 2	0.22	0 9	0 7	2 6	1 6	0 9	0 4	0 2	
0.05	0 3	0 2	0.30	1 1	0 10	2 3	1 5	0 8	0 4	0 2	
7.24	32 7	24 5	0.50	1 9	1 4	82 3	32 11	16 5	8 2	4 1	

† The figures in column (13) are the sum of columns (3), (6), (9), and (12).

‡ The figures in column (14) are the figures in column (13) from which the corresponding figures in column (3) have been subtracted.

BOTANICAL DEPARTMENT

Consulting Botanist to the Society—(vacant).

The Society have fixed the following rates of charge for the examination of plants and seeds for the *bona fide* and individual use and information of members of the Society (not being seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined schedule. The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

Scale of Charges.

1. A report on the purity, amount, and nature of foreign materials, and the germinating power of a sample of seed, 1s.
2. Determination of the species of any weed or other plant, or of any vegetable parasite, with a report on its habits and the means for its extermination or prevention, 1s.
3. Report on any disease affecting farm crops, 1s.
4. Determination of the species of any natural grass or fodder plant, with a report on its habits and pasture or feeding value, 1s.

The Consulting Botanist's Reports are furnished to enable members—purchasers of seeds and corn for agricultural or horticultural purposes—to test the value of what they buy, and are not to be used or made available for advertising or trade purposes by seedsmen or otherwise.

Purchase of Seeds.

The purchaser should obtain from the vendor, by invoice or other writing, the proper designation of the seed he buys, with a guarantee of the percentage of purity and germination, and of its freedom from ergot, and in the case of clover, from the seeds of dodder or broom-rap.

It is strongly recommended that the purchase of *prepared mixtures* of seeds should be avoided. The different seeds should be purchased separately and mixed by the farmer: mixtures cannot be tested for germination.

The Sampling of Seeds.

The utmost care should be taken to secure a fair and honest sample. This should be drawn from the bulk delivered to the purchaser, and not from the sample sent by the vendor.

When legal evidence is required, the sample should be taken from the bulk, and placed in a sealed bag in the presence of a witness. Care

should be taken that the sample and bulk be not tampered with after delivery, or mixed or brought in contact with any other sample or bulk.

At least one ounce of grass and other small seeds should be sent, and two ounces of cereals and the larger seeds. When the bulk is obviously impure the sample should be at least double the amount specified. Grass seeds should be sent at least four weeks, and seeds of clover and cereals two weeks, before they are to be used.

The exact name under which the sample has been sold and purchased should accompany it.

Reporting the Results.

The Report will be made on a schedule in which the nature and amount of impurities will be stated, and the number of days each sample has been under test, with the percentage of the seeds which have germinated.

"Hard" clover seeds, though not germinating within the time stated, will be considered good seeds, and their percentage separately stated.

The impurities in the sample, including the chaff of the species tested, will be specified in the schedule, and only the percentage of the pure seed of that species will be reported upon; but the REAL VALUE of the sample will be stated. The Real Value is the combined percentages of purity and germination, and is obtained by multiplying these percentages and dividing by 100: thus in a sample of Meadow Fescue having 88 per cent purity and 95 per cent germination, 88 multiplied by 95 gives 8360, and this divided by 100 gives 83·6, the Real Value.

Selecting Specimens of Plants.

The whole plant should be taken up and the earth shaken from the roots. If possible the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They should be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

Parcels or letters containing seeds or plants for examination (carriage or postage paid) must be addressed to

NOTE.—Members are reminded that seeds may now be tested at the Board of Agriculture for Scotland Seed-testing Station. Samples should be addressed, "The Secretary, Board of Agriculture for Scotland, SEED-TESTING STATION, York Buildings, Edinburgh."

ENTOMOLOGICAL DEPARTMENT

Consulting Entomologist to the Society—Dr R. STEWART MACDOUGALL,
9 Dryden Place, Edinburgh.

Arrangements have been made with Mr R. Stewart MacDougall, M.A., D.Sc., Edinburgh, to advise members of the Society regarding insects or allied animals which, in any stage of their development, infest—

- | | |
|-----------------------------------|-------------------------------------|
| (a) Farm crops. | (d) Fruit and fruit trees. |
| (b) Stored grain. | (e) Forest trees and stored timber. |
| (c) Garden and greenhouse plants. | (f) Live stock (including poultry). |

Members consulting Dr MacDougall will please forward with their queries examples of the injured plants, or the injured parts of plants, &c., as well as specimens of the insects or other animals believed to be the cause of the injury.

Specimens should be sent in tin or wooden boxes, or in quills, to prevent injury in transmission.

Address letters and parcels (carriage or postage paid) to Dr R. Stewart MacDougall, 9 Dryden Place, Edinburgh.

The Directors have fixed the fee payable by members to Dr MacDougall at 1s. for each case upon which he is consulted: this fee must be sent to him along with the application for information.

PREMIUMS

GENERAL REGULATIONS FOR COMPETITORS.

1. It is to be distinctly understood that the Society is not responsible for the views, statements, or opinions of any of the writers whose papers are published in the 'Transactions.'

2. All reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter, similarly marked, containing the name and address of the reporter—initials must not be used.

3. No sealed letter, unless belonging to a report found entitled to the Premium offered, or a portion of it, will be opened without the author's consent.

4. Reports for which a Premium, or a portion of a Premium, has been awarded, become the property of the Society, and cannot be published in whole or in part, nor circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors if applied for within twelve months.

5. The Society is not bound to award the whole or any part of a Premium.

6. All reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded or accepted. Weights and measurements must be indicated by the imperial standards.

7. The Directors, before or after awarding a Premium, shall have power to require the writer of any report to verify the statements made in it.

8. The decisions of the Board of Directors are final and conclusive as to all matters relating to Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

9. The Directors will welcome papers from any Contributor on any suitable subject, whether included in the Premium List or not; and if the topic and the treatment of it are both approved, the writer may be remunerated and his paper published.

CLASS I.

REPORTS.

SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

FOR APPROVED REPORTS.

1. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purpose chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

2. Approved Reports on other suitable subjects. To be lodged by 1st November in any year.

SECTION 2.—ESTATE IMPROVEMENTS.

FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive Improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Minor Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements, as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the Reporter's proprietorship.

2. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty acres of Waste Land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

3. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of Waste Land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

4. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Reports in competition for Nos. 2, 3, and 4 may comprehend such general observations on the improvement of waste lands as the writer's

experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of profitable character, and a rotation of crops must have been concluded before the date of the Report. *A detailed statement of the expenditure and return and a certified measurement of the ground are requisite.*

5. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the Pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise, without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

6. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 5 and 6 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

SECTION 3.—HIGHLAND INDUSTRIES AND FISHERIES.

FOR APPROVED REPORTS.

1. The best mode of treating native Wool; cleaning, carding, dyeing, spinning, knitting, and weaving by hand in the Highlands and Islands of Scotland—Five Sovereigns. To be lodged by 1st November in any year.

SECTION 4.—MACHINERY.

FOR APPROVED REPORTS.

To be lodged by 1st November in any year.

SECTION 5.—FORESTRY DEPARTMENT.

FOR APPROVED REPORTS.

1. On Plantations of not less than eight years' standing formed on deep peat-bog—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The premium is strictly applicable to deep peat or flow moss; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subsiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and number of trees planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

CLASS II.

DISTRICT COMPETITIONS.

REGULATIONS 1925.

Grants in aid of DISTRICT COMPETITIONS for 1926 must be applied for before 1st November 1925, on Forms to be obtained from the Secretary.

When a Money Grant has expired, the District cannot apply again for another Money Grant for four years.

SECTION I.—GRANTS TO DISTRICT SOCIETIES FOR HORSES, CATTLE, SHEEP, AND PIGS.

1. CLASS OF STOCK—LIMIT OF GRANTS, £340.—The Highland and Agricultural Society will make Grants to District Societies for prizes for *Breeding Animals* of any of the following Classes of Stock, viz. :—

<i>Cattle.</i>	<i>Sheep.</i>
Shorthorn.	Blackface.
Aberdeen-Angus.	Cheviot.
Galloway.	Border Leicester.
Belted Galloway.	Half-Bred.
Highland.	Shropshire.
Ayrshire.	Oxford-Down.
British-Friesian.	Suffolk.
Red Poll.	Wensleydale.
Jersey.	
Shetland.	<i>Pigs.</i>
<i>Horses.</i>	Any Pure Breed.
Draught Horses.	
Hunters.	
Hackneys.	
Ponies.	
Shetland Ponies.	

Cross-bred¹ animals are not eligible. The Prizes must be confined to *Breeding Animals*; "bullocks," "geldings," "wethers," and "hog pigs" are excluded.

2. All Competitions must be at the instance of a local Society. A Committee of Management shall be appointed, and the Convener of the Committee must be a Member of the Highland and Agricultural Society.

3. GRANT TO DISTRICT, £12.—The portion of the Grant to any one District Society shall not exceed the sum of £12 in any one year.

4. ALLOCATION OF GRANT.—The Grant from the Highland and Agricultural Society is not to be applied as a Grant in aid of the Premiums offered by the Local Society, but must be offered in the form of separate Prizes for the Animals chosen; and the Prizes must be announced in the Premium List and Catalogue of the Show as "given by the Highland and Agricultural Society."

¹ Exceptions to this rule may, however, be authorised by the Board of Directors, on application. The Directors are prepared to consider applications from local Societies which desire to use their grants, or part thereof, as prizes for cross-bred calves and one-year-old cross-bred cattle.

5. CONTINUANCE OF GRANT THREE YEARS.—The Money Grant shall continue for three alternate years, provided always that the District Society shall, in the two intermediate years, continue the competition by offering Premiums for the same class of Stock as that selected in each previous year to compete for the Highland and Agricultural Society's Prizes. If no competition takes place for two years the Grant expires.

6. When it is agreed to hold the General Show of the Society in any district, no provincial show shall be held in that district in the months of June, July, or August.

7. MEDALS IN INTERMEDIATE YEARS.—In the two alternate years the Highland and Agricultural Society will place three Silver Medals at the disposal of the District Societies, for the same classes of Stock as those for which the Money Premiums are offered, provided that not less than three lots are exhibited in the same class.

8. RULES OF COMPETITION.—The Rules of Competition for the Premiums, the Funds for which are derived from Grants of the Highland and Agricultural Society, shall be such as are generally enforced by the Society receiving the Grant for Premiums offered by itself.

9. AREA AND PARISHES—FIVE PARISHES.—When making application for Grants from the Highland and Agricultural Society, the District Society must delineate the area and the number of parishes comprised in the district, and, *except in special cases*, no District Society shall be entitled to a Grant whose show is not open to at least *five* Parishes.

10. REPORTS.—Blank Forms for Reports will be furnished to the Secretaries of the different District Societies. Both in the years when the Grant is offered and in the two intermediate years, detailed reports of the competition must be given on these Forms and lodged with the Secretary of the Highland and Agricultural Society as soon as possible after the Show, and in no case later than 1st November. These reports are subject to the approval of the Directors of the Highland and Agricultural Society, against whose decision there shall be no appeal. All Reports must be signed and certified as marked in the Form.

11. GRANTS—WHEN PAID.—The Grants made to District Societies will be paid in December after the Reports of the awards of the prizes have been received and found to be in order and passed by the Board of Directors, the Money Grants being paid to the Secretaries of the Local Societies and the Medals sent direct to the winners. *The Secretary of the District Society must not on any condition whatever pay any premium offered by the Highland and Agricultural Society until he has been informed that the awards are in order and has received the Grant from the Highland and Agricultural Society.*

12. RENEWAL OF APPLICATION.—No application for renewal of a Money Grant to a District Society will be entertained until the expiration of *four* years from the termination of the last Grant.

13. DISPOSAL OF APPLICATIONS.—In disposing of applications for District Grants, the Directors of the Highland and Agricultural Society shall keep in view the length of interval that has elapsed since the expiration of the last Grant, giving priority to those District Societies which have been longest off the list.

DISTRICTS.

Final Year.

1. DUMBERTONSHIRE AGRICULTURAL SOCIETY.—*Convener*, James R. Lumsden of Arden, Arden, Dumbartonshire; *Secretary*, George Lawrence, Union Bank of Scotland, Ltd., Dumbarton. Granted 1916. (In abeyance 1916, 1917, 1918, 1919, and 1924—no Show held.)

2. DUMFRIES AGRICULTURAL SOCIETY.—*Convener*, Col. F. J. Carruthers of Dormont, Lockerbie; *Secretary*, David Fergusson, 75 Buccleuch Street, Dumfries. Granted 1920. (In abeyance 1922, on account of Dumfries Show.)
3. FETTERCAIRN FARMERS' CLUB.—*Convener*, William Low, Balmakewan, Montrose; *Secretary*, George T. Brown, Woodmyre, Edzell. Granted 1921.
4. MAR AGRICULTURAL ASSOCIATION.—*Convener*, Rev. R. Littlejohn Barr, The Manse, Kinellar; *Secretary*, James Allan, Begsley, Kinaldie, Aberdeenshire. Granted 1921.
5. SUTHERLAND FARMERS' CLUB.—*Convener*, W. J. Dudgeon, Craikaig, Loth; *Secretary*, Charles B. Catto, Main Street, Golspie. Granted 1920. (In abeyance 1923, on account of Inverness Show.)

2nd Year.

6. BLACK ISLE FARMERS' SOCIETY.—*Convener*, A. O. Stewart Spence, Farness, Conon Bridge; *Secretary*, John Mann, Bog Farm, Munlochy. Granted 1922. (In abeyance 1923, on account of Inverness Show.)
7. STIRLING AGRICULTURAL SOCIETY.—*Convener*, James M'Laren, Corn-ton, Bridge of Allan; *Secretary*, John M. Mailer, 48 Port Street, Stirling. Granted 1922. (Not awarded 1923.)
8. BUCHAN AGRICULTURAL SOCIETY.—*Convener*, William E. Hutchison of Cairngall, Longside; *Secretary*, James A. Smith, Bank House, Strichen. Granted 1923.
9. CLUNY, MONYMUSK, MIDMAR, AND KENMAY AGRICULTURAL ASSOCIATION.—*Convener*, Charles Crombie, Cluny Home Farm, Sauchen; *Secretary*, George Rennie, Bank House, Sauchen, Aberdeenshire. Granted 1923.
10. DUNOON AGRICULTURAL SOCIETY.—*Convener*, Duncan C. Whyte, Glenmasson, Kilmun; *Secretary*, John Dobie, Clydesdale Bank, Dunoon. Granted 1923.
11. KINCARDINESHIRE FARMERS' CLUB.—*Convener*, George M. Calder, Midtown of Barras, Stonehaven; *Secretary*, James B. Connon, 12 Ann Street, Stonehaven. Granted 1923.
12. SKYE AGRICULTURAL SOCIETY.—*Convener*, Colonel Kenneth L. MacDonald, D.S.O., Tote, Portree; *Secretary*, George Calder, Bank of Scotland House, Portree. Granted 1923.
13. WIGTOWN AGRICULTURAL SOCIETY.—*Convener*, William Sproat, Balfarn, Kirkinner, Boreland, Whauphill; *Secretary*, Gavin Coupland, Clydesdale Bank, Newton-Stewart. Granted 1923.
14. STRATHORD AGRICULTURAL SOCIETY.—*Convener*, William Baxter, Tophead, Stanley; *Secretary*, D. M'Gregor, Rosebank, Bankfoot. Granted 1922. (In abeyance 1924, on account of Perth Show.)

1st Year.

15. DEESIDE AGRICULTURAL ASSOCIATION. — *Convener*, John Duguid, Darnford, Durris; *Secretary*, Robert Adam, 2 Union Terrace, Aberdeen. Granted 1925.
16. EAST OF FIFE AGRICULTURAL SOCIETY.—*Convener*, Major George Russell, Muircambus House, Kilconquhar; *Secretary*, George R. Dingwall, Colinsburgh. Granted 1925.
17. GARRIOCH FARMERS' CLUB.—*Convener*, Major Alexander Cleghorn, Drumrossie, Inch; *Secretary*, John Anderson, Commercial Bank of Scotland, Ltd., Inch. Granted 1925.

18. **INVERURIE AGRICULTURAL SOCIETY.**—*Convener*, William Strachan, Balquhain Mains, Pitcairle; *Secretary*, W. Gordon, Union Bank, Inverurie. Granted 1925.
19. **ST MARY'S ISLE ESTATES AND DISTRICT AGRICULTURAL SOCIETY.**—*Convener*, Thomas Cross, The Grange, Kirkcudbright; *Secretaries*, Messrs Gibson & Montgomery, Solicitors, Kirkcudbright. Granted 1925.
20. **YTHANSIDE FARMERS' CLUB.**—*Convener*, William Kemp, Aldie, Cruden Bay; *Secretary*, John Walker, 34 Bridge Street, Ellon. Granted 1925.

(In Intermediate Year—3 Silver Medals.)

21. **EASTER ROSS FARMERS' CLUB.**—*Convener*, Sir R. W. Brooke of Midfearn, Bart., Ardgay; *Secretary*, George D. Gill, Commercial Bank Buildings, Tain. Granted 1914. (In abeyance 1914, 1915, 1916, 1917, 1918, 1919, and 1922—no Show held.) (In abeyance 1923, on account of Inverness Show.)
22. **AIRD AND STRATHGLASS AGRICULTURAL, HORTICULTURAL, AND INDUSTRIAL SOCIETY.**—*Convener*, Donald Maclean, Teafush, Beaul; *Secretary*, John Campbell, Commercial Bank of Scotland, Beaul. Granted 1921. (In abeyance 1923, on account of Inverness Show.)
23. **DUNBLANE AGRICULTURAL SOCIETY.**—*Chairman of Directors*, A. H. Anderson, J.P., The Firs, Dunblane; *Secretary*, John Stewart, Solicitor, Dunblane. Granted 1921. (In abeyance 1921.)
24. **UPPER DONSID AGRICULTURAL SOCIETY.**—*Convener*, James Thomson, Mains, Glenbuchat; *Secretary*, Alexander Y. Robertson, Upper 'lowie, Glenkindie. Granted 1922.
25. **VALE OF ALFORD AGRICULTURAL ASSOCIATION.**—*Convener*, W. A. Mitchell of Auchnagathle, Keig, Whitehouse; *Secretary*, George F. Laing, Mayfield, Whitehouse. Granted 1922.
26. **WESTERN DISTRICT OF MID-LOTHIAN AGRICULTURAL SOCIETY.**—*Convener*, James Pettigrew, Bankton, Mid-Calder; *Secretary*, J. B. Small, Clydesdale Bank, Mid-Calder. Granted 1922.
27. **LOCHABER AGRICULTURAL SOCIETY.**—*Convener*, Cameron of Lochiel, Achnacarry, Spean Bridge; *Secretary*, Alistair MacDonald, Achintree, Fort-William. Granted 1924.
28. **WEST TEVIOTDALE AGRICULTURAL SOCIETY.**—*Convener*, Charles W. Grieve, Branzholm Park, Hawick; *Secretary*, W. S. Nichol, Wilton Bank, Hawick. Granted 1924.

(In Abeyance 1925.)

29. **GIRVAN DISTRICT AGRICULTURAL SOCIETY.**—*Convener*, James Clachan, Burnside, Girvan; *Secretary*, Jean W. Kennedy, Town Clerk's Chambers, Girvan. Granted 1920. (In abeyance 1921.)
30. **STRATHAVEN AND DISTRICT AGRICULTURAL EXPOSITION SOCIETY.**—*Convener*, Peter Meikle, M.R.C.V.S., Avonholme, Strathaven; *Secretary*, W. Wilson, Royal Bank, Strathaven. Granted 1921.
31. **KILFINICHEN AND KILVICKON AGRICULTURAL SOCIETY.**—*Convener*, Duncan Cameron, Sheepknowe, Bunessan, Mull; *Secretary*, Flora R. MacKechnie, Uisken, Bunessan, Mull. Granted 1923.
32. **LOWER WARD OF RENFREWSHIRE.**—*Convener*, Sir Hugh Shaw Stewart, C.B., of Greenock and Blackhall, Bart., Ardgowan, Inverkip; *Secretary*, Arthur Murray, The Commercial Bank of Scotland, Limited, 22 West Blackhall Street, Greenock. Granted 1924. (In abeyance 1924—no Show held.)

In 1925.

Nos. 1, 2, 3, 4, and 5 are in competition for the final year.

Nos. 6, 7, 8, 9, 10, 11, 12, 13, and 14 are in competition for the second year.

Nos. 15, 16, 17, 18, 19, and 20 are in competition for the first year.

Nos. 21, 22, 23, 24, 25, 26, 27, and 28 are in intermediate year and compete for local Premiums. (See Rules 5 and 7.)

Nos. 29, 30, 31, and 32 are in abeyance on account of the Glasgow Show.

SECTION II.—GRANTS TO HORSE ASSOCIATIONS, &c., FOR STALLIONS FOR AGRICULTURAL PURPOSES.

1. The Highland and Agricultural Society will make Grants to Horse Associations and other Societies in different districts engaging Stallions for agricultural purposes. The total sum expended by the Highland and Agricultural Society in such Grants shall not exceed the sum of £210 in any one year.

2. The portion of the Grant to any one Association or Society shall not exceed the sum of £15 in any one year.

3. The Grant will be available only for Stallions which, for the year to which the Grant applies, are Registered in the Register of Certified Draught Stallions published by the Board of Agriculture. (For information regarding the Registration of Stallions, apply to the Secretary of the Board of Agriculture, 4 Whitehall Place, London, S.W.)

4. The Grant will continue for three years provided the Association receiving the Grant shall hire a Registered Stallion in the two intermediate years.

5. In the event of a Horse not being engaged in any one year while the provisions of the Grant are in force, the Grant made by the Highland and Agricultural Society will cease.

6. RULES 2 (Committee and Convener), 10 (Reports), 11 (Time of Payment), 12 (Renewal of Grant), and 13 (Disposal of Applications) applicable to Section 1, shall be applicable to this Section.

DISTRICTS.

Final Year.

1. DUMBARTONSHIRE HORSE-BREEDING SOCIETY.—*Convener*, James Snodgrass, Milligs Farm, Helensburgh; *Secretary*, William Davie, 258 Main Street, Alexandria. Granted 1921.
2. GATEHOUSE DISTRICT HORSE-BREEDING SOCIETY.—*Convener*, Fred J. Turner, Castramont, Gatehouse-of-Fleet; *Secretary*, Robert A. Mitchell, Cally Estate Office, Gatehouse-of-Fleet. Granted 1921.
3. STIRLING DISTRICT CLYDESDALE HORSE SOCIETY.—*Convener*, James Rodger, Rochdale Lodge, Bridge of Allan; *Secretary*, Alexander Paterson, Solicitor, 62 Port Street, Stirling. Granted 1921.

2nd Year.

4. LOWER DONSDALE HORSE-BREEDING SOCIETY, LIMITED.—*Convener*, Patrick Forbes, Tillybin, Kintore; *Secretary*, Neil Smith, Kinellar, Aberdeenshire. Granted 1923.

5. SOUTH RONALDSHAY AND BURRAY HORSE-BREEDING SOCIETY.—*Convener*, John Tomison, jun., Halcro, South Ronaldshay, Orkney; *Secretary*, George A. Ryrie, Hall of Herston, South Ronaldshay, Orkney. Granted 1923.
6. UPPER NITHSDALE HORSE SOCIETY.—*Convener*, Charles W. Balston, Dubton, Thornhill; *Secretary*, William M. Henderson, 1 West Morton Street, Thornhill. Granted 1923.
7. VALE OF ALFORD CLYDESDALE HORSE-BREEDING ASSOCIATION.—*Convener*, William Brown, M.R.C.V.S., Silverbank, Banchory; *Secretary*, John Reid, Monaltrie, Alford. Granted 1923.
8. WEST OF FIFE CLYDESDALE ENTIRE HORSE SOCIETY.—*Convener*, Robert Jeffrey, Drumfin, Torryburn; *Secretary*, John B. Tulloch, The Dales, Inverkeithing. Granted 1923.

1st Year.

9. CROMER AND UPPER DEESIDE HEAVY HORSE-BREEDING SOCIETY.—*Convener*, William Hunter, Old Town of Kincairnie, Tarrand; *Joint-Secretaries*, Messrs Baird & Reid, East Knowehead, Tarrand. Granted 1925.

Intermediate Year—Grant in Abeyance.

10. DEESIDE STOCK IMPROVEMENT SOCIETY.—*Convener*, William Brown, Silverbank, Banchory; *Secretary*, William S. Taylor, South Hirn, Banchory. Granted 1922.
11. ISLAY SMALL LANDHOLDERS' SOCIETY.—*Convener and Secretary*, Robert Cullen, Bridgend, Islay. Granted 1922.
12. MORAY STOCK IMPROVEMENT SOCIETY.—*Convener*, Gordon R. Shiach of Rosebrae, Elgin; *Secretary*, W. Rose Black, Bank Buildings, Elgin. Granted 1922.
13. SHAPANSEY AGRICULTURAL ASSOCIATION.—*Convener*, James Johnston, of Coubister, Orphir House, Orphir, Orkney; *Secretary*, D. L. Kemp, Gatehouse, Shapansey, Orkney. Granted 1922.
14. STONEHAVEN DISTRICT HORSE-BREEDING ASSOCIATION.—*Convener*, William Hunter, Redcloak, Stonehaven; *Secretary*, James B. Connon, 12 Ann Street, Stonehaven. Granted 1922.
15. CAITHNESS HORSE-BREEDING ASSOCIATION.—*Convener*, George King, Berridale R.S.O., Caithness; *Secretary*, A. G. Doull, Berridale R.S.O., Caithness. Granted 1924.
16. CARSE OF DUNDEE DISTRICT STALLION SOCIETY.—*Convener*, John Murray, Balruddery Farm, Invergowrie; *Secretary*, Joseph Murray, Balruddery Farm, Invergowrie. Granted 1924.
17. CUMBERNAULD, KILSYTH, AND KIRKINTILLOCH CLYDESDALE HORSE SOCIETY.—*Convener*, Alexander Whitelaw, Gartshore, Kirkintilloch; *Secretary*, Alexander Park, 175 Hope Street, Glasgow. Granted 1924.

In 1925.

Nos. 1, 2, and 3 are in competition for the final year

Nos. 4, 5, 6, 7, and 8 are in competition for the second year.

No. 9 is in competition for the first year.

Nos. 10, 11, 12, 13, 14, 15, 16, and 17 are in abeyance, and compete for local premiums. (See Rule 4.)

SPECIAL GRANTS.

ANNUAL.

- £20 to the Ayrshire Agricultural Association, to be competed for at the Dairy Produce Show at Kilmarnock.—*Chairman of Directors*, Lieut.-Colonel W. T. R. Houldsworth of Kirkbride, Maybole; *Secretary*, John Howie, 58 Alloway Street, Ayr. Granted 1872. (No competition 1914, 1915, 1916, 1917, 1918, and 1919.)
- £15 to the Northern Arts and Crafts Society.—*Joint-Secretaries*, Mrs Gordon Cumming, Stoneyfield, and Miss Mary Mackintosh, Raigmore, Inverness. Granted 1922. (In abeyance 1923—no competition.)
- The British Dairymaids' Association.—*Convener*, Mrs Ogilvy, Fenton Newmains, Drem; *Secretary*, Miss Mary B. Baillie, Rosebank, Currie. 1 Minor Gold Medal and 1 Medium Silver Medal for Champion Butter-making Competitions. Granted 1908. (In abeyance 1914, 1915, 1916, 1917, 1918, and 1923—no competition.)

IN ALTERNATE YEARS.—GRANTS IN 1925.

- £3 to Orkney Agricultural Society.—*Convener*, James Johnston, of Coubister, Orphir House, Orphir, Orkney; *Secretary*, D. B. Peace, jun., 4 Old Scapa Road, Kirkwall. Granted 1883. (No Show in 1915, 1916, 1917, and 1918.)
- £3 to Sanday Agricultural Society, Orkney.—*Convener*, W. Cowper Ward, Scar House, Sanday, Orkney; *Secretary*, James Irvine, West Brough, Sanday, Orkney. Granted 1902. (In abeyance 1915, 1916, 1917, and 1918—no Show held.)
- £3 to East Mainland Agricultural Society, Orkney.—*Convener*, James G. Skea, Barns of Ayre, Deerness; *Secretary*, John Tait, Campston, Quoyburray, Kirkwall. Granted 1898. (In abeyance 1917 and 1918—no Show held.)
- £3 to West Mainland Agricultural Society, Orkney.—*Convener*, James M. H. Robertson, Lyking, Sandwick, Orkney; *Secretary*, James Wood, Skail Farm, Sandwick, Stromness, Orkney. Granted 1900. (No Show 1916, 1917, or 1918.)
- £3 to Walls and Hoy Agricultural Society.—*Convener*, Robert Cutt, Melsetter, Stromness; *Secretary*, William Sutherland, The Old Custom House, Longhope, Orkney. Granted 1923 (for three alternate years).
- £3 to Kilmuir (Skye) Show Committee.—*Convener and Secretary*, Angus Ross, Rha, Uig, Skye. Granted 1923 (for three alternate years).

GRANTS IN ABEYANCE, 1925.

- £5 to Shetland Agricultural Society.—*Convener*, J. J. Brown, County Assessor, Lerwick; *Secretary*, James M'Intosh, Ronald Street, Lerwick. Granted 1893. (In abeyance—no Show in 1914, 1915, 1916, 1917, 1918, or 1919.)
- £3 to North Uist Agricultural Society.—*Convener*, Dr M. T. Mackenzie, J.P., Scolpaig, North Uist; *Secretary*, H. H. Mackenzie, J.P., Balalone, Lochmaddy. Granted in 1915 for 3 alternate years. (In abeyance 1915, 1916, 1917, 1918, 1919, and 1924—no Show held.)

- £23 to Rousay Agricultural Society, Orkney.—*Convener*, George Gibson, Avelshay, Rousay, Orkney; *Secretary*, John Harrold, Springfield, Rousay. Granted 1903. (No Show 1915, 1916, 1917, or 1918.)
- £23 to South Ronaldshay and Burray Agricultural Society, Orkney.—*Convener*, John Tomison, Halcro, St Margaret's Hope, Orkney; *Secretary*, George Esson, St Margaret's Hope, Orkney. Granted 1904. (In abeyance 1917 and 1918—no Show held.)

WOMEN'S RURAL INSTITUTES.

A sum not exceeding £100 in each year will be given in special grants to Federations of Scottish Women's Rural Institutes. The amount of any one grant shall not exceed £10. Any Institute which has received a grant for two consecutive years shall not be eligible to again apply until after the expiry of two years.

- £10 to Berwickshire Federation of Women's Rural Institutes.—*President*, Mrs Blackadder, Ninewell Mains, Chirnside; *Secretary*, Miss E. Jardine, Reston House, Reston. Granted 1924.
- £10 to Fife Federation of Women's Rural Institutes.—*President*, Miss E. V. Baxter, The Grove, Upper Largo, Fife; *Secretary*, Miss Margaret H. Marshall, Lochmalong, Cupar, Fife. Granted 1924.
- £10 to Forfarshire Federation of Women's Rural Institutes.—*President*, Mrs Whyte, Easter Denoon, Glamis; *Secretary*, Mrs J. A. W. Dundas, Tarbirns, Kirriemuir. Granted 1924.
- £10 to Inverness-shire County Federation of Women's Rural Institutes.—*President*, Mrs James Ryan, Blar-a-cha, Roybridge; *Secretary*, Miss C. A. Cameron, Glenfintaig, Spean Bridge. Granted 1924.
- £10 to Caithness Federation of Women's Rural Institutes.—*President*, Mrs Macaulay, Dunnet, Thurso; *Secretary*, Miss Elizabeth M. Green, Keiss, by Wick. Granted 1925.
- £10 to Perth and Kinross Federation of Women's Rural Institutes.—*President*, Mrs Stuart Fotheringham, Murthly Castle, Murthly; *Secretary*, Mrs Gardner, The Manse, Auchterarder. Granted 1925.

MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

The Society, being anxious to co-operate with local Associations, will give a limited number of Silver Medals annually to Societies, not on the list of Cattle, Horse, or Sheep Premiums, in addition to the Money Premiums awarded in the Districts, for—

1. Best Bull, Cow, or Heifer of any pure breed included in Section 1.
2. Best Stallion, or Mare of any pure breed included in Section 1.
3. Best Tup, or Pen of Ewes of any pure breed included in Section 1.
4. Best Boar, Sow, or Breeding-Pig of any pure breed.
5. Best Pens of Poultry.
6. Best Sample of any variety of Wool.
7. Best Sample of any variety of Seeds.
8. Best managed Farm.
9. Best managed Green Crop.

10. Best managed Hay Crop.
11. Best managed Dairy.
12. Best Sweet-Milk Cheese.
13. Best Cured Butter.
14. Best Fresh Butter.
15. Best collection of Roots.
16. Best kept Fences.
17. Best Sheep-Shearer.
18. Most expert Hedge-Cutter.
19. Most expert Labourer at Draining.
20. Best Maker of Oat-Cakes.

It is left to the local Society to choose out of the foregoing list the classes for which the Medals are to be competed.

The Medals are granted for two years, and lapse if not awarded in those years.

No Society shall receive more than two Medals in any year.

Aberdeenshire.

1. ABERDOUR AND NORTH-EASTERN AGRICULTURAL ASSOCIATION.—*Convener*, M. J. Keith, Aberdour House, Fraserburgh; *Secretary*, Alexander Rannie, Hillhead, Pitullie, Fraserburgh. 2 Medals. Granted 1924.
2. CROMAR, UPPER DEE, AND DONSIDER AGRICULTURAL SOCIETY.—*Convener*, Major William H. Coltman of Blelack, Logie, Coldstone; *Secretary*, William Anderson, Home Farm, Hopewell, Tarland. 2 Medals. Granted 1924.

Argyllshire.

3. MULL AND MORVEN AGRICULTURAL SOCIETY.—*Convener*, J. H. Munro Mackenzie, Calgary, Isle of Mull; *Secretary*, A. A. MacGill, The Clydesdale Bank, Limited, Tobermory. 2 Medals. Granted 1923. (In abeyance 1924—no Show held.)

Ayrshire.

4. BEITH FARMERS' SOCIETY.—*Convener*, John Crawford, Maurahead, Beith; *Secretary*, Alexander D. Osborne, 37 Eglinton Street, Beith. 2 Medals. Granted 1924. (In abeyance 1924—no Show held.)
5. NEW CUMNOCK FARMERS' SOCIETY.—*Convener*, William Hyslop of Bank, Bank House, New Cumnock; *Secretary*, R. D. Hunter, 42 Ayr Road, Cumnock. 2 Medals. Granted 1924. (In abeyance 1924—no Show held.)

Banffshire.

6. CENTRAL BANFFSHIRE FARMERS' CLUB.—*Convener*, William S. M'William, Garbity, Orton Station, Morayshire; *Secretary*, George Smith, 65 Moss Street, Keith. 2 Medals. Granted 1924.
7. MARNOK AND CORNHILL AGRICULTURAL SOCIETY.—*Convener*, George Smith, Ordens, Boyndie, Banff; *Secretary*, William Gray, Mill of Park, Cornhill. 2 Medals. Granted 1924.

8. NORTHERN SEEDS AND ROOTS ASSOCIATION.—*Convener*, George Smith, Ordens, Boyndie, Banff; *Secretary*, A. Bannerman Robb, 39 Seafield Street, Portsoy. 2 Medals. Granted 1924.

Dumfriesshire.

9. ESKDALE AND LIDDESDALE AGRICULTURAL SOCIETY.—*Convener*, W. E. Annandale, Hopsrigg, Langholm; *Secretary*, James J. Paterson, Terrona, Langholm. 2 Medals. Granted 1924. (In abeyance 1924—not awarded.)

Lanarkshire.

10. SHOTTS CALDERWATERHEAD FARMERS' SOCIETY.—*Convener*, John Weir, Shottsburn, Salsburgh, Holytown; *Secretary*, William Good, Home Farm, Hartwood. 2 Medals. Granted 1923. (In abeyance 1924—no Show held.)
11. SHETTLESTON AND CHRYSTON DISTRICT AGRICULTURAL SOCIETY.—*Convener*, James C. Caldwell, 95 Morrison Street, Glasgow, S.S.; *Secretary*, John Watson, 24 St Vincent Place, Glasgow. Granted 1925.

Linlithgowshire.

12. BATHGATE AGRICULTURAL ASSOCIATION.—*Convener*, James W. Adamson, Inch Farm, Bathgate; *Secretary*, John B. Wood, National Bank, Bathgate. 2 Medals. Granted 1923. (In abeyance 1924—not awarded.)

Mid-Lothian.

13. DALKEITH AGRICULTURAL SOCIETY.—*Convener*, John C. Stewart, Newton, Dalkeith; *Secretary*, James W. Speedy, Braeside, Liberton. Granted 1925.

Orkney.

14. SOUTH RONALDSHAY AND BURRAY AGRICULTURAL SOCIETY.—*Convener*, John Tomison, Halcro, South Ronaldshay; *Secretary*, George Esson, St Margaret's Hope. 2 Medals. Granted 1924.
15. ROUSAY AGRICULTURAL SOCIETY.—*Convener*, George Gibson, Avelshay, Rousay; *Secretary*, John Harrold, Springfield, Rousay. Granted 1925.

Stirlingshire.

16. DENNY AND DUNIPACE AGRICULTURAL SOCIETY.—*Convener*, Alexander Cook, Burnhouse, Denny; *Secretary*, John M'Millan, 37 Stirling Street, Denny. 2 Medals. Granted 1924. (In abeyance 1924—no Show held.)

Sutherlandshire.

17. KINCARDINE AND CREICH AGRICULTURAL SOCIETY.—*Convener*, Sir Robert Brook, Bart., Fearn Lodge, Ardgay; *Secretary*, D. Munro, Bank of Scotland House, Bonar Bridge. Granted 1925.
18. SUTHERLAND CROFTERS' SHOW.—*Convener and Secretary*, James Mann, Sutherland Estate Offices, Golspie. 2 Medals. Granted 1924.

Applications from other Districts must be lodged with the Secretary of the Society by 1st November next.

RULES OF COMPETITION.

1. All Competitions must be at the instance of a local Society.
2. The classes for which Medals are granted must be in accordance with the list at page 59. The Committee shall select the classes, and specify them in the Report.
3. A Committee of Management shall be appointed, and the Convener of the Committee must be a Member of the Highland and Agricultural Society.
4. The Money Premiums given in the District must be not less than £2 for each Medal claimed.
5. The Medal for Sheep-Shearing shall always accompany the highest Money Premium.
6. There must not be fewer than three competitors in all the classes.
7. Regarding Reports, despatch of Medals, and application for renewal of Grant, Rules 10 and 11, Section I., will apply.
8. When a grant of Medals has expired, the District cannot apply again for Medals for two years.

PLOUGHING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first Premium at Ploughing Competitions, provided a Report in the following terms on the official form is made to the Secretary, within one month of the Competition, by a Member of the Society. Forms of Report to be had on application.

FORM OF REPORT.

I, _____ of _____, Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the _____ Association at _____ in the county of _____ on the _____ when _____ ploughs competed; _____ of land were assigned to each, and _____ hours were allowed for the execution of the work. The sum of £ _____ was awarded in the following proportions, viz. :—

[Here enumerate the names and designations of successful Competitors.]

RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.
2. The title of such Society or Association, together with the name and address of its Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 3 George IV. Bridge, Edinburgh.
3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.
4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.
5. A Member can report only one Match; and a Ploughman cannot carry more than three Medals in the same season.
6. To warrant the grant of the Medal there must have been twelve ploughs in Competition, and not less than Three Pounds awarded in Prizes by the local Society. The Medal to be given to the winner of the first prize.

7. The Local Society or Ploughing Association shall decide what class of ploughs shall compete for the Medal, and if so agreed, may offer it for competition to the class of plough most generally in use in the district.

8. The Local Society or Committee may, if they desire, arrange to let each Ploughman have one person to guide the horses for the first two and the last two furrows, but in no case shall Ploughmen receive any other assistance, and their work must not be set up or touched by others. Attention should be given to the firmness and sufficiency of the work below, more than to its neatness above the surface.

9. The Local Committee is required to fix the time to be allowed for ploughing the portion of land, and they are recommended that the time be at the rate of not more than ten hours per imperial acre on light land, and fourteen hours on heavy or stony land.

NOTE.—The attention of the Directors of the Society has frequently been drawn to certain irregularities which have occurred in connection with the conduct of Ploughing Matches and the completion of the Reports thereon. Complaints have been made (a) that the allotted amount of ground has not been ploughed, within the specified time, by the competitor awarded the first prize; (b) that the Report sent to this Society has been signed by a Member of the Society who was not present at the Match. It has to be pointed out that any infringement of the above Rules by a Local Society or Ploughing Association will render that Society or Association liable, at the discretion of the Board of Directors, to be debarred from receiving the Society's Medals in future.

HOEING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first Premium at Hoeing Competitions, provided a Report in the following terms on the official form is made to the Secretary within a month of the Competition by a Member of the Society. Forms of Report to be had on application.

RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Hoeing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.

2. The title of such Society or Association, together with the name and address of its Secretary, must be registered with the Secretary of the Highland and Agricultural Society, No. 3 George IV. Bridge, Edinburgh.

3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.

4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.

5. A Member can only report one Match; and same Competitor cannot carry more than three Medals in the same season.

6. To warrant the grant of the Medal there must have been twelve hoes in Competition, and not less than Three Pounds awarded in prizes by the local Society. The Medal to be given to the winner of the first prize.

7. The time to be allowed to be decided by the local Committee, but in no case to exceed two hours for two drills of 100 yards each, the third drill being unoccupied, so that Competitors do not interfere with their neighbour's work.

8. Competitors must finish their work as they go along—no turning

back or after-dressing allowed. Handpicking or transplanting shall be strictly prohibited.

9. A Committee shall be appointed to watch the work, and any Competitor found transplanting or otherwise not complying with the Rules shall have his number withdrawn, and be debarred from receiving any prize which might otherwise have been awarded to him.

NOTE.—Medals will be awarded under similar conditions for Competitions in hand-singling.

LONG SERVICE CERTIFICATES AND MEDALS.

Certificates and Medals for long service are awarded by the Society to farm servants, male or female, having an approved service of not less than thirty years—(a) with one employer on the same or different holdings; (b) on the same holding with different employers. These Certificates and Medals will be issued as applications are received.

Forms to be obtained from the Secretary.

War Service to count towards the time required for qualification, where farm servants have returned to same service or employment with same farmer or his family.

CLASS III.

COTTAGES AND GARDENS.

The following Premiums are offered for Competition in the Parishes after mentioned.

The Premiums are granted for two years.

PREMIUMS FOR BEST KEPT COTTAGES AND GARDENS.

1. Best kept Cottage	.	.	.	.	.	£1 0 0
Second best	.	.	.	.	.	0 10 0
2. Best kept Cottage Garden	.	.	.	.	.	1 0 0
Second best	.	.	.	.	.	0 10 0

RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Lodges at Gentlemen's Approach Gates and Gardeners' Houses are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It is left to the Committee of the District to regulate the maximum annual rent of the Cottages, which may, with the garden, be from £5 to £7.

4. To warrant the award of full Premiums, there must not be fewer than three competitors in each class. If there are less than three competitors in each class, only half Premium will be awarded.

5. A person who has gained the highest Premium cannot compete again.

6. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly; the windows must be free of broken glass, clean, and affording the means of ventilation. Dunghills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

7. In estimating the claims for the Garden Premiums, the judges should have in view—the sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

8. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be lodged with the Secretary of the Highland and Agricultural Society *on or before the 1st November next*.

9. When a grant of Money has expired, the District cannot apply again for aid for four years.

Parishes desirous of these Premiums must lodge applications with the Secretary *on or before the 1st November next*.

(No Money Grants offered in 1925.)

MEDALS FOR COTTAGES AND GARDENS, OR GARDEN PRODUCE, POULTRY, AND BEE-KEEPING.

1. The Society will give annually one or two Minor Silver Medals to a limited number of local Associations or individuals, who establish Competitions and Premiums for Cottages, Gardens, Garden Produce, or Bee-Keeping. The Medals will be granted for two years.

2. The Medals may be offered in any two of the following sections, *but under no circumstances will the two Medals be given in one of the sections:—*

(1) Best kept Cottage or best kept Cottage and Garden. (One Medal only.)

(2) Best kept Garden. (One Medal only.)

(3) Best Collection of Garden Produce—Flowers excluded. (One Medal only.)

(4) Best Pen of Poultry.

(5) Honey. (One Medal only.)

3. The annual value of each Cottage, with the ground occupied in the parish by a Competitor, must not exceed £20. The occupiers of Lodges at Gentlemen's Approach Gates, and Gardeners in the employment of others, are not entitled to compete.

4. If Competition takes place for Garden Produce, such produce must be *bona fide* grown in the Exhibitor's Garden. He will not be allowed to make up a collection from any other Garden. The produce must consist of Vegetables, or Vegetables and Fruit (not Fruit alone). Flowers are excluded.

5. The Honey must be the produce of the Exhibitor's own Hives.

6. To warrant the award of a Medal, there must not be fewer than three Competitors.

7. Blank forms for Reports of Competitions will be furnished to the Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary of the Highland and Agricultural Society as soon as possible after the Show, and in no case later than *1st November*, for the approval of the Directors, against whose decisions there shall be no appeal.

8. When a grant of Medals has expired, the District cannot apply again for aid for two years, and if no competition takes place in a District for two years the grant expires.

9. Applications for these Medals must be made *before 1st November next*.

Aberdeenshire.

1. CRUDEN HORTICULTURAL SOCIETY.—*Convener*, Robert Brand, Ardiffery, Port Erroll; *Secretary*, James Hendry, Schoolhouse, Hatton, Aberdeen. 2 Medals. Granted 1925.

Fifehire.

2. DYSART PARISH HORTICULTURAL SOCIETY.—*President*, Thomas Storrer, 106 High Street, Dysart; *Secretary*, Alexander Penman, Cluny Bank, Windmill Road, Kirkcaldy. 2 Medals. Granted 1924.

Perthshire.

3. FORTINGALL HORTICULTURAL AND INDUSTRIAL SOCIETY.—*Convener*, Peter Anderson, J.P., Rose Cottage, Fortingall; *Secretary*, William E. Young, Garth Gardens, Fortingall, Aberfeldy. 2 Medals. Granted 1924.

FIRST EDITION.]

NOTE.—From 8th till 18th July all communications should be addressed to “The Secretary, Secretary’s Office, Showyard, Glasgow.”

*Address for Telegrams—“SOCIETY,” EDINBURGH.
Telephone No.—CENTRAL 3655.*

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

GENERAL SHOW OF STOCK, IMPLEMENTS, AND MACHINERY

GLASGOW

14TH, 15TH, 16TH, AND 17TH JULY 1925.

LAST DAYS OF ENTRY.

IMPLEMENTS AND OTHER ARTICLES—Monday, 27th April.
CATTLE, HORSES, SHEEP, GOATS, AND PIGS—Thursday, 21st May.
(Separate Form for EACH Entry.)
POULTRY, RABBITS, DAIRY PRODUCE, WOOL, RURAL INDUSTRIES, AND
HORSE-SHOEING—Thursday, 21st May.
HONEY—Thursday, 11th June.

No Entry at ordinary fees taken later than those which are received at the Society’s Office, Edinburgh, by first post, or 10 o’clock, on Friday morning (22nd May). Late Entries for Cattle, Horses, Sheep, Goats, and Pigs taken on payment of 10s. additional for each entry (Poultry, Dairy Produce, Wool, Rural Industries, and Horse-shoeing at double fees) till 10 o’clock Wednesday morning (27th May) at the Society’s Office, Edinburgh.

President of the Society.

THE RIGHT HON. THE LORD BLYTHSWOOD, K.C.V.O.

Chairman of the Board of Directors.

J. T. M’LAREN, THE LEUCHOLD, DALMENY.

Condener of the Local Committee.

SIR THOMAS PAXTON, BART., LL.D.

The District connected with the Show comprises the Counties of Argyll, Ayr, Bute, Lanark, and Renfrew.

REGULATIONS.

GENERAL CONDITIONS.

1. The Competition, except where otherwise stated in the Premium List, is open to Exhibitors from all parts of Great Britain, Northern Ireland, and Irish Free State.

Entries.

2. Every Lot must be intimated by a Certificate of Entry, lodged with the Secretary *not later than Monday, 27th April, for Implements and other Articles, and Thursday, 21st May, for Stock, Poultry, Rabbits, and Dairy Produce, &c.* No Entry taken at ordinary fees later than those which are received at the Society's Office by first post, or 10 o'clock, on Friday morning, 22nd May. Late Entries for Cattle, Horses, Sheep, Goats, and Pigs taken on payment of 10s. additional for each entry (Poultry, Rabbits, Dairy Produce, Wool, Rural Industries, and Horse-shoeing at double fees) till 10 o'clock Wednesday morning (27th May), at the Society's Office, Edinburgh. Printed forms of Entry will be issued on application to the Secretary, No. 3 George IV. Bridge, Edinburgh. Admission Orders for Exhibits and Attendants will be forwarded to Exhibitors, by post, previous to the Show.

Between 21st May and 11th June an Exhibitor who has made, in due time, an entry of Horses, Cattle, Sheep, Goats or Pigs, in a particular class, will be permitted to substitute for it an entry of another animal in the *same class* on payment of a fee of Five Shillings per entry.

Licences for moving Stock.

3. This Premium List is published and the Show will be held subject to any Orders that may be issued by the Ministry of Agriculture or Local Authorities. Any licences that may be required for the movement of Stock into or away from the Show must be obtained by Exhibitors. For these licences application should be made to the Chief Constable, Glasgow.

Diseased Animals.

4. Animals suffering from any form of infectious or contagious disease—including ringworm or other form of infectious or contagious skin ailment—must not be brought to the Show. Those infringing this Rule shall be liable to a fine of 40s., and to have their Stock removed.

Fees to accompany Entries.

5. No Entry can be received or recorded unless it is accompanied by the necessary fees, and complies fully with the Regulations in the Premium List, the Secretary being empowered to return entries sent without the necessary fees.

Particulars of Entries.

6. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor. The Society shall have power at any time to call upon an Exhibitor to furnish proof of the correctness of any statement in his entry.

Names of Breeder.

7. The name of the Breeder, if known, must be given, and if the Breeder is not known, a declaration to that effect, signed by the Exhibitor, must be made on the Entry Schedule, and no pedigree will be entered in the Catalogue when the Breeder is unknown.

No substitution of Animals.

8. All animals, except calves, foals, and lambs shown with their dams, must be entered in the classes applicable to them, and cannot be withdrawn after entry, or other animals be substituted in their place, except as provided in Rule 2 above.

One Class only.

9. For prizes given by the Society, no animal shall be allowed to compete in more than one class, or to compete in any class except that prescribed for animals of its pedigree and description; but this Rule does not apply to the Jumping and Harness Classes.

Ownership.

10. All stock exhibited at the Show, except where otherwise stated in the Premium List, must be, at the time of entry, the *bona fide* property of the Exhibitor in whose name it is entered.

Responsibility for Entries.

11. Exhibitors are alone responsible for the accuracy and eligibility of their entries. The recording of an entry or the admission of the exhibit to the Showyard will not relieve the Exhibitor of this responsibility. The entry-fee paid for an animal entered in a class for which it is not eligible is not returnable.

12. The Society shall not be liable for any loss or damage which Stock, Poultry, Dairy Produce, &c., Implements, or other articles may sustain at the Show, or in transit. *Society not liable.*

13. The Society reserve to themselves the right of refusing, cancelling, or prohibiting the exhibition of entries from any person who, after 1st January 1904, has been expelled from the membership of any Agricultural or Dairy Society, or who may have been prohibited, suspended, or disqualified from making entries or exhibiting at the Show or Shows of any Agricultural or Dairy Society or Breed Society in consequence of having attempted to obtain a Prize by giving a false Certificate, or by other unfair means, or who is under exclusion from any Breed Society for fraudulent practices. *Disqualified Exhibitors.*

14. When an animal has previously been disqualified by the decision of any Agricultural or Breed Society in the United Kingdom, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity. *Animal Disqualified.*

15. Any artificial contrivance or device of any description found on or proved to have been used on an animal, either for preventing the flow of milk or for any other improper purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal may be prohibited from again entering Stock for any of the Society's General Shows, for such a period as the Directors may see fit. *Tampering with Animals.*

16. Horses shall not be blindfolded while being shown in the Ring.

17. The Society further reserve to themselves the right of refusing any entries they may think fit to exclude, or to cancel any entry made, or to prohibit the exhibition of any entry. *Blindfolding Horses. Rejecting Entries.*

18. Stock entered for competition, and actually in the Show, is subject to the control and under the orders of the Stewards, Secretary, and other Show officials of the Society, and such stock may not be withdrawn from competition without the consent of the Stewards or Secretary. *Control of Exhibits.*

19. Persons making insulting remarks to, or in any way unduly interfering with, the Judges, Stewards, or other officials while in the performance of their duties, and all Exhibitors or others in charge of stock while in the judging rings refusing to accept or display tickets, rosettes, &c., awarded by the Judges, and handed to them by the Stewards or other officials, or tearing up tickets, rosettes, &c., so awarded and handed to them, or indulging in any similar conduct, shall be considered guilty of misconduct, and shall be dealt with under these rules. *Improper Conduct.*

20. All persons in charge of stock or other exhibits, and all persons admitted into the Showyard, shall be subject to the rules of the Society, and shall obey the orders of the Stewards, Secretary, and other officials of the Society. Exhibitors shall be answerable for the conduct of their servants or representatives. *Subject to Orders.*

21. The Stewards and other officials have power to enforce the regulations of the Society in their different departments. *Power of Officials.*

22. A protest having reference to exhibits at the Show may be lodged by any person having interest. Protests having reference to competitions which take place on the first day of the Show must be lodged in writing with the Secretary at his Office in the Showyard not later than 9 A.M. on Wednesday, the second day of the Show, and parties must be in attendance at the Secretary's Office in the Showyard at 9.30 A.M. that day, when protests may be disposed of. Protests relating to competitions taking place after the first day of the Show must be lodged before 5 P.M. on the day on which the particular exhibition takes place. Each protest must state specifically the grounds of objection, and must be accompanied by a deposit of £2, 2s., which deposit may, if the objection be proved frivolous to the satisfaction of the Directors, be forfeited. Protests may be lodged at any time by Directors, *Protests.*

and in this case no deposit will be required. Protests will be heard and determined by the Directors. Protests on veterinary grounds not received.

*Penalties
for
Offences.*

23. The violation of any one of the regulations, or disobedience of the orders of the Directors, Stewards, Secretary, or other officials of the Society, shall render the offending person liable to the forfeiture of all premiums awarded to him, or of such a portion as the Directors may ordain, and also liable to be expelled from the membership of the Society, and disqualified from again, or for a certain number of years, exhibiting at the Shows of the Society, or to have his case disposed of by fine or otherwise as the Directors may determine.

*Final
Authority.*

24. The decision of the Directors shall, in every matter arising at or in connection with the Show, be final; and every person present at the Show, whether as a Judge, Exhibitor, Visitor, or otherwise, shall be deemed thereby to have agreed to refer the subject-matter of such decision to the final determination of the Directors to the exclusion of all Courts of Law.

*Intimating
Decisions.*

25. All decisions under these rules may, along with the names and addresses of the persons against whom such decisions have been pronounced, be communicated by the Secretary of this Society to the Secretaries of all Agricultural or Dairy Societies holding open Shows in the United Kingdom, and to the Secretaries of all Breed Societies in the United Kingdom, and may be published in the Annual Reports of this Society, and in such newspapers or journals as the Directors may determine; and every Exhibitor competing at the Show, and every person present at the Show, whether as a Director, Member of Committee, Steward, Judge, Exhibitor, Visitor, or otherwise, shall be deemed thereby to have consented to such communication and publication.

*Former
Winners.*

26. An animal to which a first Premium has been awarded, even if it should not qualify for that Premium, or an animal which subsequently becomes entitled to a first Premium, at a General Show of the Society, cannot again compete in the same class, notwithstanding any alteration in the heights stated for such class, but may be exhibited as Extra Stock.

*Herd-
books.*

27. Shorthorn, Aberdeen-Angus, Galloway, Highland, British Friesian, Red Poll, and Belted Galloway cattle must be entered in the herd-books—Ayrshire Cattle in the herd-book or any Appendices thereto—or the Exhibitor must produce evidence that his animal is eligible to be entered therein.

*Height of
Horses.*

28. All Horses or Ponies entered in classes in which a particular height is stated shall, before being judged, be measured with their shoes on. No subsequent measuring or alteration of shoes will be permitted.

*Weight of
Shoes.*

29. Exhibitors of Hackney and Harness Horses shall be required to adhere to the Rules and Regulations of the Hackney Horse Society with regard to the weight of shoes on their exhibits, the Society's Veterinary Inspector being instructed to examine all the Hackneys and Harness Horses on the opening morning of the Show, and see that the following Rules as to the weight of shoes are attended to—viz., (a) For Hackneys exceeding 14 hands (except Hackney yearling colts and Hackney yearling fillies), no shoe (nails included) may exceed 2 lb. in weight; (b) for Ponies not exceeding 14 hands, Hackney yearling colts and Hackney yearling fillies, no shoe (nails included) may exceed 1½ lb. in weight.

*Overfeed-
ing.*

30. Breeding Stock must not be shown in an improper state of fatness, and the Judges are requested not to award Premiums to overfed animals; and no Cattle or Sheep which after the age of twelve months have been exhibited as Fat Stock at any Show are eligible to compete in the Breeding Classes for the Society's Prizes.

Sires.

31. Aged Bulls and Stallions must have had produce, and, along with two-year-old Bulls, three-year-old Colts, and two-shear and aged Tupes, have served within the twelve months immediately preceding the Show.

*Calving
Cows.*

32. Except as may be otherwise specially provided in this Premium List, cows of all breeds (other than Ayrshire, British Friesian, and Red Poll) must

have had a calf within nine months previous to the Show, and when exhibited must be in milk. Cows of the Ayrshire, British Friesian, and Red Poll breeds must have had a calf within fifteen months previous to the Show. *Animals of any age that have had a calf must be shown as Cows.*

33. Two-year-old Heifers of the Shorthorn, Aberdeen-Angus, Galloway, British Friesian, Red Poll, and Belted Galloway breeds, two-year-old Yeld Ayrshire Heifers, and three-year-old Highland Heifers, must be in calf when exhibited, and the Premiums will be withheld till birth be certified, which must be within nine months after the Show. *In-calf Heifers.*

34. A Mare entered in a class for "Mares with foal at foot" must have produced a foal after 1st January of the year of the Show, must have regularly nursed her own or another foal, and must have the foal with her in the Show. If the mare's own foal is alive it must be the foal shown with the mare. In the case of a Mare that has not foaled before the Show, or whose foal has died, she shall, if not in milk, be eligible without further entry to compete among the Yeld Mares if a corresponding class for Yeld Mares be included in the Premium List. Draught Yeld Mares must produce a foal within twelve months from the first day of the Show. A Mare in a class for "Mares or Geldings" may or may not have had a foal in the year of the Show, but shall not have her foal exhibited with her, nor be in milk at the time of the Show. *Mares.*

35. All Sows born in or before 1923 must have produced a litter of pigs in the year of the Show before the opening day. Sows born between 1st January and 1st September 1924 must either have produced a litter of pigs before the Show, or produce a litter within three months of the last day of the Show. Certificates of the date of farrowing must be supplied in every case. *Sows.*

36. With reference to Regulation 33, birth of a live or full-time calf must be certified; and in regard to Regulation 34, birth of at least a nine months' foal; or in the case of the death of the dam, a Veterinary Surgeon's certificate must be produced certifying that at the time of death the animal was so far advanced with calf or foal that if it had lived it would have produced a calf or foal within the periods stated in Rules 33 and 34. Certificates required by the foregoing Regulations will be issued after the Show, and must reach the office of the Secretary as follows: calving certificates within ten months, farrowing certificates within four months, and foaling certificates within thirteen months, of the last day of the Show. In default of this, the animal will be regarded as having failed to fulfil the Regulations, and the prize will therefore pass to the animal next in order of merit or be forfeited. *Calves and Foals. Calving, Farrowing, and Foaling Certificates.*

37. Except when otherwise provided, the awards of Special Prizes shall not be subject to the Regulations as to calving and foaling. *Special Prizes.*

38. The Premiums awarded, except these withheld till birth of calf or foal or litter of pigs is certified, will be paid as soon after the Show as practicable, and, with the exception of the Tweeddale Gold Medal, Special Cups, and Medals, may be taken either in money or in plate. *Payment of Prizes.*

39. No Stallion or entire Colt, two years old or upwards, shall be allowed to compete for any of the Society's Prizes unless it has previously been licensed for stud purposes during the current year by the Board of Agriculture for Scotland, the Ministry of Agriculture and Fisheries, or the Irish Department of Agriculture. *Veterinary Examination of Stallions and Colts.*

40. Judges are particularly requested to satisfy themselves, as far as possible, regarding the soundness of all Horses before awarding the Prizes, and to avoid giving Prizes to animals showing symptoms of hereditary disease. The Judges may consult the Society's Veterinary Surgeon if they deem it expedient. Private accommodation is provided for the examination of horses by the Veterinary Surgeon. No protests on veterinary grounds will be received. *Soundness of other Horses. Accommodation for examination.*

- Ewes.** 41. Every Ewe must have given birth to and reared a lamb in the year of the Show; and Ewes of the Blackface and Cheviot breeds must be in milk, and have their lambs at foot.
- Milking.** 42. Animals in milk of the Dairy breeds must be milked dry at 6 o'clock on the evening previous to the opening of the Show in the presence of, and to the satisfaction of, the Steward of Cattle or a representative of the Society duly authorised by him. Animals arriving after six o'clock will be milked dry at the time of arrival.
- Clipping.** 43. Sheep must have been clipt bare after the first day of the November preceding the Show, no part of the animal to be clipt prior to that date—this Rule not to apply to Cheviot Sheep.
No Blackface Sheep shall be eligible which has not been clipt bare on or after the 1st April of the year of the Show.
- Colouring, &c., of Sheep and Pigs.** 44. The Steward of Sheep, who can call in assistance if so desired by him, shall have full power to disqualify any pen of Blackface, Cheviot, Border Leicester, and Half-bred Sheep which he considers unnaturally coloured, or when the fleece, face, or legs have been dealt with by the use of foreign substances.
The use of artificial whitening or powder on Large White and Middle White Pigs is prohibited, and the Judge is empowered to disqualify any pig so whitened or powdered.
- Flock Books.** 45. All Oxford Down and Suffolk Sheep shown must be entered or eligible for entry in the Oxford Down and Suffolk Flock Books respectively.
- Poultry.** 46. In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.
- Railway Passes.** 47. Railway Certificates for Stock are issued to Exhibitors before the Show along with their Tickets of Admission, one Certificate for the outward and another for the return journey being sufficient for each Exhibitor for any number of exhibits (see page 80).
- Admission of Stock.** 48. Poultry and Stock will be admitted on Monday, the day before the opening of the Show, and, with the exception of Horses, must be in the Yard before 12 o'clock that night. Horses must be in before 8 o'clock on the morning of Tuesday, except those entered in classes for which other times for arrival are elsewhere stated in this List. Judging begins at 9.30 a.m. on Tuesday. Exhibited on Tuesday, Wednesday, Thursday, and Friday. Stock may be admitted on the Saturday preceding the Show, but only by sending two days' prior notice to the Secretary's Office in the Showyard.
- Parades.** 49. Horses and Cattle must be paraded at the times stated in the Programme of the Show, and when required by the Stewards, and under their direction. Females of the Highland Cattle breed will, on this occasion, be paraded at the option of the exhibitor. In Parade, Horses must be ridden or led as provided in their respective classes. Prize and commended Cattle and Horses will receive two rosettes each, which must be attached to the head of the animal, one on each side. Attendants must be beside their animals *twenty minutes before the hour of Parade*, and be ready to proceed to the ring immediately on receiving the order of the Stewards. Infringement of this Rule, or failure of any attendant to obey the orders of the Society's officials, will render the Exhibitor liable to a fine of 20s. for each separate infringement or act of disobedience, and to the forfeiture of any or all of the Prizes awarded to him at this Show.
- Responsibility of Exhibitors.** 50. Exhibitors shall be answerable for all acts, whether committed by themselves, their servants, or others in charge of their Stock, and shall be responsible for the condition of their animals during the whole time they remain in the Showyard.
- Moving from stalls.** 51. No animal shall be taken out of its stall after 10 a.m. during the Show except by order of the Stewards, or with permission of the Secretary.
- Washing Cattle.** 52. Cattle shall not be taken out of their stalls to be washed after the Judging has commenced. Cattle must not be washed beside the Judging Rings. Those infringing this Rule shall be liable to a fine of 10s.

53. Soap or other adhesive material must not be used in dressing cattle or horses. Infringement of this Rule will render the animal upon which the material is used liable to be disqualified. *Soaping prohibited.*

54. Loose-boxes will be provided for all horses; covered accommodation for other live stock. Stalls for nurse cows charged at ordinary rates. Boxes (floored) for attendants on Cattle, Horses, Sheep, Goats, and Pigs will be provided at a charge of 40s. for each box for members; 50s. for non-members. (See Rule 79.) *Loose-boxes and Stalls.*

55. Exhibitors requiring the boxes, stalls, or pens for their animals to be floored must give instructions, stating the Catalogue No., to the Society's Showyard Erector, Mr John Reid, Showyard, ten days before the Show opens. (For charges, see Rule 78.) *Floored Boxes and Stalls for Animals.*

56. Bulls must be secured by nose-rings, with chains or ropes attached, or with strong halters and double ropes. All Cattle, other than Highland Cattle, must be tied in their stalls. *Securing Cattle.*

57. During the time the Show is open to the public no rug shall be hung up so as to conceal any animal in a horse-box or stall, except with the special permission of the Steward of that department. *Concealing Animals.*

58. Five days' supply of straw, hay, grass, and tares will be provided free by the Society. Any additional fodder or other kinds of food required will be supplied at fixed prices in the Forage-yard. The Forage-yard will close at 1.30 p.m. on Friday, the last supply to be given to attendants then; and if any extra supply is required on account of stock remaining in the Yard after the close of the Show, notice must be given to the Forage Steward not later than 5 o'clock on Thursday. Any servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not *grass, tares, hay, or straw*. Coops, food, and attendance for Poultry and Rabbits will be provided by the Society. *Fodder.*

59. Servants in charge of Stock must bring their own buckets or pails, and a piece of rope or sheep-net to carry their forage. Mangers, and sheep and pig troughs, will be provided. *Feeding appliances.*

60. Sawdust must not be used as bedding for Stock. *Sawdust.*

61. As the command of water in the Yard is limited, it is particularly requested that waste be avoided. *Water.*

62. No lights allowed in the Yard at night, and Smoking is strictly prohibited within the Sheds. Those infringing this Rule shall be liable to a fine of 10s. The gates will be closed at midnight, and no person shall be allowed to enter or leave the Yard between that time and 5 A.M. without a special permit. *Lights and Smoking.*

63. Stock or Poultry cannot be removed from the Yard till 5 P.M. on Friday, the last day of the Show, except on certificate by the Veterinary Surgeon employed by the Directors, countersigned by the Steward of the department or the Secretary. *Closing of Gates.*

64. At the close of the Show on Tuesday, Wednesday, and Thursday, horses may be withdrawn for the night on a deposit of £5 for each animal, which shall be forfeited, along with any prize money it may have gained, if the animal is not brought back. They must return between 7 and 7.30 the following morning, and those not in before 8 shall forfeit 10s. Horse passes to be applied for at the Secretary's Office between 5 and 6 p.m. on Tuesday, and the deposit, unless forfeited in whole or in part, will be returned between 12.30 and 2.30 on Friday. *Removal of Stock.*

65. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule shall be liable to a fine of 10s., and to be detained till all the other Stock is removed. *Withdrawal of horses over-night.*

66. Poultry may be penned before the opening and removed at the close of the Show by Exhibitors themselves or their representatives. In the event of neither the Exhibitor nor an authorised representative *Order in removal.*

Penning and removing Poultry.

of the Exhibitor being present to pen or remove Poultry, the birds will be penned and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of Exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to Exhibits by errors or accidents in penning, despatching, or conveying Exhibits.

*Closing of
Poultry
Shed to
Public.*

67. On the opening day of the Show the Poultry Shed will be closed to the public during the Judging. On the last day of the Show the Poultry Shed will be closed to the public at 4 P.M.; at 5 P.M. Exhibitors or their representatives will be admitted to the Shed to remove Exhibits, provided the Exhibitor has, *not later than 11 A.M. on the last day of the Show*, given written notice to the Secretary to the effect that the Exhibitor or the Exhibitor's representative will attend at the Poultry Shed at 5 P.M. to remove the birds. (Rules 66 and 67 also apply to Rabbit exhibits.)

JUDGING STOCK AND POULTRY.

*Opening
Gates.*

68. On Tuesday, the first day of the Show, no person will be admitted, except Servants in charge of Stock, till 8 A.M., when the Gates are opened to the public.

Judging.

69. The Judges will commence their inspection at 9.30 A.M. The spaces reserved for the Judging will be enclosed, and no encroachment shall be permitted.

*Insufficient
merit.*

70. In no case shall a Premium be awarded unless the Judges deem the animals to have sufficient merit; and where only one or two lots are presented in a class, and the Judges consider them unworthy of the Premiums offered, it shall be in their power to award a lower prize.

*Commenda-
tions.*

71. In addition to the Premiums, the Judges may award **one** Very Highly Commended, **one** Highly Commended, and as many Commended tickets in each class as they consider justified by the number and merit of the entries.

*Ayrshire,
British
Friesian,
and Red
Poll Cows
and
Heifers.*

72. Ayrshire, British Friesian, and Red Poll Cows which have not calved before the Show, whether entered in a class for Cows in Milk or for Cows in Calf, shall be judged along with the Cows in Calf, and Ayrshire, British Friesian, and Red Poll Cows or Heifers which have calved before the Show—in whichever of the classes entered—shall be judged along with Cows in Milk.

*Attending
Members'
duties.*

73. Attending Members will accompany each section of the Judges. It will be the duty of Attending Members to bring the animals out to the Judges and to see that no obstruction is offered to them, and that the space reserved for them is not encroached upon; to ticket the prize animals; to send the Nos. of the prize animals to the Award Lectern near the Secretary's Office; to assist the Judges in completing their return of awards; and should any difficulty arise, to communicate with the Stewards or Secretary.

74. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or attending Member in any class in which he is competing.

DAIRY PRODUCE.

75. Dairy Produce will be received in the Showyard on Monday, the day before the opening of the Show, and till 8 A.M. on Tuesday, the first day of the Show. Judged at 9.30 A.M. on Tuesday. Exhibited Tuesday, Wednesday, Thursday, and Friday.

*Placing
and re-
moving
Dairy
Produce.*

76. Dairy Produce must have been made on the Exhibitor's farm in the year of the Show. No Exhibitor shall show more than **one** lot in each class. Exhibits of Dairy Produce may be placed before the opening and removed at the close of the Show by Exhibitors themselves or their representatives. In the event of neither the Exhibitor nor a person with

written authority from the Exhibitor being present to place or remove exhibits, they will be placed and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of Exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. In the case of exhibits which are not removed by 5.30 P.M. on the closing day of the Show, the Society will hold itself at liberty to hand them over to the railway companies for despatch to the respective Exhibitors.

STALL RENT (INCLUDING ENTRY FEE).

77. The Stall Rents (which include Entry Fees) as stated opposite the individual Classes in this List, shall be paid by Exhibitors when making their Entries. The Secretary is instructed to return entries sent without the necessary fees. *Stall Rent.*

FLOORED BOXES AND STALLS.

78. Exhibitors desiring the boxes, stalls, or pens for their animals to be floored can have this done by giving instructions, stating the Catalogue No., ten days before the opening of the Show, to the Society's Showyard Erector (Mr John Reid, Showyard), to whom the following charges for flooring have to be paid: Horses, 30s. each; Ponies, Cattle, Sheep, and Pigs, 20s. each. *Floored Stalls for Animals.*

ACCOMMODATION FOR ATTENDANTS.

79. Boxes for accommodation of attendants on Stock will, if desired, be provided beside the Stock at a charge of 40s. per box for members and 50s. for non-members. Attendants' boxes will be floored and lined with wood, with door. Applications for attendants' boxes must accompany entries of Stock, and Exhibitors must state the animal next to which the attendants' box is to be placed. Attendants' boxes cannot be guaranteed after the closing date. *Accommodation for Attendants.*

IMPLEMENTS AND OTHER ARTICLES.

80. Implements will be received in the Yard from Tuesday, 7th July, till 5 o'clock on the afternoon of Monday, 13th July. Exhibited Tuesday, Wednesday, Thursday, and Friday. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor, and prices must be stated. *Admission of Goods.*

81. No Money Prizes or Medals, except when specially offered, will be given by the Society for Implements of any kind. *Premiums.*

82. Agricultural Implements, and Implements and collections of articles not Agricultural, will be received for Exhibition, but the Secretary is entitled to refuse Entries from dealers in articles not deemed worthy of Exhibition. *Refusing Entries.*

83. In order to encourage exhibits of Agricultural Implements from operative Blacksmiths and Carpenters in the district of the Show, open space will be provided for these in some less prominent part of the Yard at a charge of 15s. for space 10 feet wide and 20 feet deep. *Local Operatives.*

84. Every article to be exhibited must be entered on the Society's Entry Form. Any article not so entered that is taken to the Show is liable to be ordered out of, or removed from, the Showyard, or confiscated to the Society. Exhibitors infringing this rule are moreover liable to a fine of £1. *Articles not entered.*

*Selling by
auction
and noisy
behaviour
forbidden.*

85. "Cheap-Jacks" are not admitted to the Showyard. The selling of goods by auction, shouting, and other behaviour calculated to annoy visitors or Exhibitors, are strictly forbidden. Exhibitors infringing this Regulation are liable to a fine of £1, and to have themselves and their goods ordered out of, or removed from, the Showyard, or to have their goods confiscated to the Society.

*Placing
Exhibits.
Removing
Exhibits.*

86. The articles of each Exhibitor must all be placed in one stand, except Implements in motion, and must not on any account extend beyond the allotted space. No article shall be moved out of its stand, or the stand dismantled, till the termination of the Show, at 5 P.M. on Friday. Those infringing this Rule shall be liable to a fine of 10s.

*Restoring
Turf.*

87. When the ground requires to be broken, the turf must be carefully lifted and laid aside, and the surface must be restored to the satisfaction of the Society, and at the expense of the Exhibitor. Failing this being done, the Society shall be at liberty to restore the ground and charge the cost to the Exhibitor.

*Arranging
Exhibits.*

88. Exhibitors must arrange their own articles *within* the space allotted to them before 9 o'clock on Tuesday, and to the satisfaction of the Stewards in charge of the Implement Yard. Exhibitors are prohibited from sub-letting space allotted to them, and from displaying the name of any other firm on their Stand. All signs, except signs on gables, must face the front only. Nails must not be driven into the canvas.

Signs.

Handbills.

89. Exhibitors are not allowed to distribute handbills anywhere in the Yard except at their own Stand; and they must not for this or any other purpose encroach upon the adjacent alleys or open spaces.

*Sweeping
Stands,
&c.*

90. Exhibitors are required to have their Stands and the portions of the alleys immediately adjoining them swept up before eight o'clock on each morning of the Show.

Fuel.

91. All Machines requiring steam or fire must be entered as such in the Certificate, and will be placed in the Motion Yard. *Coke only shall be used in all cases where fire is required.* Coal shall not be used at any time in the Showyard. Those infringing this Rule shall incur a penalty of £5.

*Steam
Engines.*

92. No Steam Engine shall be driven in the Yard at a greater speed than 4 miles an hour. Traction Engines shall not be used in conveying Exhibits or other goods from one place to another in the Showyard.

*Traction
Engines.*

93. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Secretary or Stewards, and must not leave their stands till 6 P.M. on Friday.

*Consigning
Imple-
ments.*

94. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the Implement, as well as the number of the Exhibitor's stand.

95. The carriage of all Implements must be prepaid.

*Photo-
graphing
in Show-
yard.*

96. Photographing in the Showyard is not permitted, except by photographers having a Stand in the Showyard or holding a "Photographer's Ticket." The "Photographer's Ticket" may be had from the Secretary, price 20s. It admits the holder to the Show when open to the public, and entitles him to photograph in the Showyard, subject to arrangements made by the Stewards. It does not entitle the holder to sell photographs in the Showyard. No photographer shall be allowed in the ring during Parades, except with the sanction of the Steward of Parades.

Offices.

97. Covered Booths for Offices (9 feet by 9 feet), purely for business, not for exhibition of goods, can be had for £6 to Members and £8 to Non-Members.

*Exhibitors'
and Atten-
dants'
Tickets.*

98. Each Exhibitor in the Implement Department who is not a Member of the Society will receive one free Ticket of Admission to the Showyard for himself or a member of his firm, and will receive, in addition, for the use of attendants employed by him at his Stand, two Tickets of Admission for each complete ten feet of shedding in the

Motion Yard, and one Ticket for each complete ten feet of shedding in the other sections. No additional Free Tickets can be issued in any circumstances whatever. Additional Attendants' Tickets, not more than five for one Exhibitor, may be obtained by application in writing by the Exhibitor at 5s. each. *No tickets will be issued without an Order.*

99. The Tickets of Admission for Exhibitors and Attendants referred to in the foregoing Regulation will (about fourteen days prior to the Show) be issued to the Exhibitors in blank, with the number of the Exhibitor's Stand. The name of the person for whom each ticket is intended must be written on it before it is used. Each person holding a Free Ticket of Admission must sign his or her name on the back thereof, and must also, when required, sign his or her name in the book at the Entrance Gate. Exhibitors' attendants are strictly cautioned not to lend or transfer their Tickets, which can be used only by the persons whose names they bear, and who must be *bona fide* acting for, or employed by, the Exhibitor. No Ticket is transferable. An Exhibitor is liable to a fine of £1 for each case of transfer or other improper use of a Ticket issued to himself or employee.

Tickets to be filled up and signed.

Tickets not Transferable. Improper use of Tickets.

100. The following are the arrangements for the admission of Supplies (Refreshments or other goods) for Stand-holders during the Show: Messenger on foot (with or without hand-barrow) with supplies, admitted by Special Ticket; price for one admission, 2s., for the four days, 6s. Motor or horse vehicle and driver, with supplies, admitted by Special Ticket; price for one admission, 2s., for the four days, 10s. These Special Tickets may be had from the Secretary. Vehicles, with supplies, admitted throughout the day on the first day of the Show; on the other three days they will not be admitted between the hours of 10 A.M. and 5 P.M. except by written permit from the Secretary.

Admission of Supplies for Stand-holders.

101. The riding of Cycles in the Showyard is prohibited.

Cycles. Accidents.

102. The Society will not be responsible for any accident that may occur from the machinery belonging to any Exhibitor; and it is a condition of entry that each Exhibitor shall hold the Society harmless, and indemnify it against any legal proceedings arising from any accident caused by his machinery.

103. The giving of Alcoholic Drinks to visitors at Stands in the Show is strictly prohibited.

Alcoholic Drinks. Gas.

104. Exhibitors desiring the use of gas in the Showyard should apply to the Manager of the Corporation Gas Works, Glasgow, not later than Saturday, 6th June.

105. * Ground to be taken in spaces of 10 feet frontage by 20 feet deep, except in Motion Yard, which is to be 10 feet or larger amount of frontage by 50 feet deep. Exhibitors must take their space in one or other of the following Sections. Space is not let partly covered and partly open. Exhibits not in motion may be excluded from the Motion Yard. The space in the Motion Yard being limited in extent, and intended mainly for exhibits in motion, not more than one-fifth of the space allotted to any one Exhibitor—and in no case more than 400 square feet—may be occupied in the Motion Yard by exhibits not in motion.

Space for Stands.

Exhibits not in Motion.

106. The maximum extent of space which any one Exhibitor may apply for shall be 40 feet of frontage in the Motion Yard, and 100 feet of frontage in the other Sections.

Maximum Space.

107. The Society reserves the right to allot to applicants for Stands either the whole or part of the space they ask for.

Allocation of space.

108. Exhibitors requiring work executed in connection with the fitting up of stands allotted to them must employ the Society's Showyard Erector—Mr John Reid, 55 Blenheim Place, Aberdeen. The execution of orders received later than one week before the opening of the Show cannot be guaranteed.

* Special provision may be made for Exhibitors of both machinery in motion and implements and machinery not in motion on application being made to the Secretary.

109. Rates for space, payable by Exhibitors when making their Entries:—

	Members.	Non-Members.
1. Open ground without Shedding, 20 ft. deep, per 10 ft.	£1 10 0	£2 10 0
2. Special open ground, without Shedding, 20 ft. deep, per 10 ft.	3 0 0	4 0 0
3. Ordinary Shedding, 20 ft. deep, 7 ft. to eave, per 10 ft.	1 15 0	2 10 0
4. Special Shedding, 20 ft. deep, 7 ft. to eave, per 10 ft.	3 0 0	4 0 0
5. Ordinary Shedding, 20 ft. deep, 7 ft. to eave, <i>close boarded at back</i> , per 10 ft.	3 0 0	4 0 0
6. Special Shedding, 20 ft. deep, 7 ft. to eave, <i>close boarded at back</i> , per 10 ft.	4 10 0	5 10 0
7. *Motion Yard, without Shedding, 50 ft. deep, per ft.	0 7 0	0 12 0
8. *Motion Yard, with Shedding (10 ft. open behind, 20 ft. covered, and 20 ft. <i>open in front</i>), 11 ft. to eave, per foot	0 11 0	0 15 0
9. Covered Booths for offices, 9 ft. by 9 ft., each	6 0 0	8 0 0
10. Press offices, 9 ft. by 9 ft., each	£4.	

* See Rules 105 and 106.

All internal fittings to be executed by the Exhibitor at his own expense. The Society's Showyard Erector must be employed. See Rule 108.

NEW IMPLEMENTS.

1. An Exhibitor who desires to enter a "New Implement" for competition for the Society's Silver Medal must enter it separately as a "New Implement" at the commencement of the specification of his proposed exhibits; and he must define clearly, on a special form obtainable from the Secretary, the exact nature of the novelty which qualifies such implement to be entered for a Medal. Unless the "New Implement" be properly described in the specification, and particulars of its novelty are given at the time of making the entry, it will not be accepted.

2. For each entry of a "New Implement," sent with an application for space, made in accordance with Regulation 109, a non-returnable Entry Fee of £1 will be charged. Late entries of "New Implements" only will, however, be considered up to 1st June, provided that no increase of space beyond that originally allotted to the Exhibitor will be occasioned by such New Implements being shown at his stand.

3. In cases of sufficient merit, the Judges will recommend the award of the Society's Silver Medal to New Implements for agricultural or estate purposes, or to new improvements in such implements. No award shall be made without such trial as may be approved by the Directors.

4. The Society does not bind itself to try in the field every "New Implement" entered for a Silver Medal. Any Exhibitor who expresses a wish to do so can, with the sanction of the Steward of Implements, at his own expense take his New Implement out of the Showyard during the Show week and put it to work, and if within a reasonable distance, the Judges will, if they deem it necessary, inspect it at work and decide if it is worthy of a Silver Medal.

5. No Silver Medals will be awarded to, nor can any entry as New Implements be accepted of, machines of any class for which competitive trials have been announced by the Society as about to take place.

6. The Judges of New Implements will commence their inspection at 2.30 p.m. on Tuesday, 14th July, and will take in rotation the stands of the exhibitors who have entered New Implements for the Society's Silver Medals. A notice will be posted at the Secretary's Office each evening giving the number of the stand at which the Judges will commence their inspection next morning. Each Exhibitor, or his representative, will be expected to be at the stand to explain the working of the Implement to the Judges. If the exhibit be not ready and in working order by the time the Judges make their inspection, it is liable to be struck off the list.

7. All publications by exhibitors of the award of the Society's Silver Medals must state the year of the award, and must specify the exact nature of the "New Implement," of the improvement, or of the attachment to an Implement, for which the Silver Medal has been awarded.

8. On the recommendation of the Judges, with the approval of the Directors, any New Implement of merit, which cannot be sufficiently tried, or which is capable of further development, may be entered and exhibited as a "New Implement" at the succeeding Show of the Society.

9. The Judges' decision, when duly accepted and recorded, will in all cases be final.

RESERVED SEATS (NUMBERED) IN GRAND STAND.

For Charges and Tickets, apply to Secretary up to opening day of Show. Thereafter tickets are sold only at the Booking-Office in Showyard behind Grand Stand.

ADMISSION OF THE PUBLIC.

The public will be admitted daily at 8 A.M. Judging begins on Tuesday at 9.30 A.M. The charges for admission to the Yard will be—Tuesday, from 8 A.M. till 5 P.M., 7s. 6d. Wednesday, from 8 A.M. till 5 P.M., 5s. ; from 5 P.M. to 8 P.M., 2s. 6d. Thursday, from 8 A.M. till 5 P.M., 2s. 6d. ; from 5 P.M. till 8 P.M., 1s. Friday, from 8 A.M. till 5 P.M., 1s.

On Thursday and Friday children under twelve years of age admitted at 6d.

No Pass-out Checks given, and no re-admission without payment.

Season Tickets—12s. 6d. each on application to Secretary. On the days of the Show, Season Tickets are sold only at the Entrance Gates.

ADMISSION OF MEMBERS AND EXHIBITORS.

On exhibiting their "*Member's Badge*," which is strictly not transferable, Members of the Society are admitted free to the Showyard. Badges will be sent to all Members residing in Great Britain, Northern Ireland, and Irish Free State, whose addresses are known, and on no account will duplicates be issued. All Members not producing their badges must pay at the gates, and the admission money will not on any account be returned. Badges must be signed by Members before being presented at the gate, and Members should continue to wear the badge during the whole time that they are in the Showyard.

Tickets of admission to the Showyard are sent to Exhibitors of Stock, Poultry, Dairy Produce, &c. (not Members), whose Entry Fees amount to not less than 12s. 6d.

For Exhibitors of Implements and their assistants tickets are issued as provided in the Regulations for Implements.

VARIOUS.

Exhibitors may display their own Placards *inside and in front* of their stands ; with this exception, no Bills of any kind other than those of the Society are permitted on any of the Show erections. No newspapers or any other articles to be carried about the Yard for sale or display.

No Carriages or Equestrians admitted without special leave from the Directors, and then only for Invalids. Bath-chairs may be brought in.

Premium Lists, Regulations, and Certificates of Entry may be obtained by applying at the Secretary's Office, No. 3 George IV. Bridge, Edinburgh.

All Communications should be addressed to The Secretary of the Highland and Agricultural Society of Scotland, No. 3 George IV. Bridge, Edinburgh. From 8th to 16th July, to the Secretary's Office, Showyard, Glasgow.

Address for Telegrams—"SOCIETY," EDINBURGH.

Telephone No.—CENTRAL 3655.

RAILWAY ARRANGEMENTS.

The Railway Companies will be furnished with a list of the Exhibitors of Stock and Implements, after the 23rd June. All applications for horse-boxes and trucks, and for information as to train arrangements, must be made by the Exhibitors themselves to the Stationmaster where their stock is to be trucked.

The arrangements made by the Railway Companies for the conveyance of Live Stock and Goods to and from the Show are indicated below, but exhibitors are recommended to apply to the respective companies for full particulars :—

1. Live Stock and Goods *to* the Show to be charged ordinary rates.
2. Live Stock and Goods *from* the Show, if sold, to be charged ordinary rates.
3. Live Stock from the Show, if unsold, and returned not later than the second day after the closing day of the Show (excluding Sunday), to be carried at half rates back to the Station whence the animals were sent, and by same route, at owner's risk, on surrender of a Certificate from the Exhibitor, provided and signed by the Secretary, to the effect that they are really unsold; failing surrender of such certificate, ordinary rates will be charged.

4. Live Poultry from the Show, *if unsold*, to be carried by Passenger Train at half-rates back to the Station from which sent, at O.R., on surrender of a certificate signed by the Secretary of the Show to the effect that the Poultry are unsold and remain the property of the exhibitor. No certificate will be required for such traffic which is intended by the owner to be returned from the Show to the original Sending Station by the same route as originally forwarded and the charges prepaid for both the outward and return journeys.

Poultry are only charged at the half-rate when returned not later than the second day after the closing of the Show (Sunday being treated as a *dies non*).

5. Horse-boxes, or other Passenger Train vehicle, will not be provided for the carriage of Live Stock sent by Goods Train and invoiced at Goods Train rates. *For rates for Horse-boxes by Passenger and Special Trains, apply to the Railway Companies.*

6. Provender conveyed to and from Agricultural Shows with Live Stock will be charged at the applicable rates, subject to a free weight allowance, viz.—

Cattle	.	.	.	.	per animal, 56 lb.
Horses	.	.	.	.	56 "
Sheep, goats, lambs, pigs, and calves	.	.	.	.	28 "

7. The carriage of all Live Stock, Implements, and other articles going to the Show for exhibition must be PREPAID; and the carriage on all traffic *returned from the Show by Passenger Train Service must be PREPAID.*

The carriage charges on Live Stock conveyed in special vehicles by Passenger Train and intended to be returned to the original sending Station may also be prepaid for the return journey at the original sending Station if the owner so desires.

The Railway Charge on all exhibits which are conveyed by Passenger Train in the Guard's Van and intended to be returned from the Show direct to the original sending Station by the same route must be PREPAID, for both the outward and return journeys, at the original sending Station. The agreed form of address label for Poultry, Dairy Produce, Bee Appliances, and Wool exhibits, which will be supplied through the Secretary of the Society, must be used in such cases.

8. Attendants in charge of Live Stock are conveyed free in the cases shown below, when certified by the owners to be *bona fide* in charge of such Live Stock :—

In Horse-Boxes.—Horses and Cattle: One man for each consignment, except where the consignment requires more than one vehicle, when one man to each vehicle may be sent free; but where two or three Horses or Cattle forming one consignment are sent in the same Horse-box and a man is required to travel with each animal, a man for each animal may be conveyed free, provided each animal is charged for separately.

In Horse-Boxes.—Small animals: One man to each vehicle.

In specially constructed Cattle Trucks.—Cattle or other animals: One man to each vehicle.

9. Agricultural Machines, Implements, and other Exhibits from the Show,

if unsold, to be conveyed at half rates back to the Station whence they were sent, at Owner's risk, on production of a Certificate from the Exhibitor to the effect that they are unsold; failing production of such Certificate, ordinary rates must be charged. The reduction to half rates is to be allowed only when the articles are returned by the same route as that by which they were conveyed to the Show, but it shall be in the option of the Railway Company or Companies to return the articles at half rates by a different route.

10. Unsold goods, previously carried by railway, transferred from one Agricultural Show to another, in another part of the country, or exhibited at several Shows consecutively, and returned to the Station from whence originally sent, will be conveyed at half rates at Owner's risk, on production of Certificate from the Exhibitor, provided and signed by the Show Secretary, to the effect that they are unsold; failing production of such Certificate, ordinary rates will be charged. This applies only to Goods Trains.

11. The ordinary rates charged for carriage do not in any case include delivery to, or collection from, the Showground.

12. Agricultural Societies' Show Plant must be charged at Class C rates, station to station.

13. Tents, Canvas, and other articles, not for exhibition, to be charged the ordinary rates both going and returning.

14. Carriages and other Road Vehicles are only conveyed by Passenger Train when this can be conveniently done.

DELIVERY AND COLLECTION CHARGES.

Cartage Charges to be paid by the Exhibitor for the Delivery or Collection of traffic between the Railway Station at Govan and the Showground of the Highland and Agricultural Society's Show at Glasgow, on 14th, 15th, 16th, and 17th July 1925.

	At C. & D. Rates.	At S. to S. Rates.
General traffic	3s. 6d. per ton.	5s. 9d. per ton.
Minimum charge per consignment	2s.	3s.
Implements and Machinery (Agricultural), not exceeding 1 ton each	3s. 6d. per ton.	5s. 9d. per ton.
Minimum charge per delivery	2s.	3s.
Implements and Machinery (Agricultural) on their own wheels (specially hauled), not exceeding 1 ton	6s. each.	8s. 3d. each.
When hauled on their own wheels behind a lorry, loaded or partly loaded with goods, actual weight at	6s. per ton.	8s. 3d. per ton
Single articles, exceeding 1 ton but not exceeding 3 tons	6s. per ton.	8s. 3d. per ton.
Single articles, exceeding 3 tons but not exceeding 5 tons	7s. 6d. per ton.	9s. 9d. per ton.
Single articles, exceeding 5 tons, by special arrangement only, but no less charge than	10s. per ton.	12s. 3d. per ton.
Rustic Houses, by special arrangement only, but no less charge than	15s. per load.	
Carriages, on their own wheels	6s. each.	
Cattle, in floats	6s. per head.	
Minimum charge for each float	9s.	
Sheep, Goats, and Pigs, in floats	1s. 6d. per head.	
Minimum charge for each float	9s.	
Pigs, in crates	3s. 6d. per crate.	
Minimum charge per load	7s.	
Ordinary Parcels by passenger train	6d. each.	

Miscellaneous passenger train traffic, including packages of plants and flowers carried at O.R. rates S. to S. . . .

Minimum charge per consignment . . .	9d. per cwt.
*Poultry in crates or hampers . . .	1s. 6d.
*Rabbits in crates, hampers, &c. . .	} 9d. per crate or hamper.

* Poultry and Rabbit exhibits only will be conveyed at the Society's expense from the Railway Station to the Showyard and back, but no exhibit subject to railway charges will be received by the Society. All other delivery charges must be paid by the Exhibitor.

REGULATIONS FOR GOAT CLASSES.

The animals will be milked dry at 6 o'clock on the evening previous to the opening of the Show, in the presence of, and to the satisfaction of, the Steward or a representative of the Society duly authorised by him.

All exhibits must be registered either in the Herd-Book, Foundation Book, Show Register, or Kid Register of the British Goat Society, in the name of the exhibitor (the registered number being quoted on the entry form), or if previously entered or owned by someone other than the exhibitor, a transfer of ownership must be registered with the British Goat Society.

MILKING COMPETITION—CLASS 153.

The animals will be milked at 7 P.M. on Tuesday, 14th July, at an appointed place in the order arranged by the Steward, and the milk of the next thirty-six hours will be taken for the trials. The hours of milking shall be 7 A.M. and 7 P.M. on Wednesday, 15th July, and 7 A.M. on Thursday, 16th July.

All Goats must have kidded within twelve months of the first day of the Show.

The prizes will be awarded according to the following scale of points :—

For each pound of milk 1 point.

For each 6 days the Goat has been in milk (deducting the first forty days after kidding), with a maximum of 5.4 points $\frac{1}{10}$ of a point.

The period of lactation to be calculated from the date of kidding to the first day of the Show. No prize will be awarded to a goat giving less than 4 lb. of milk per day.

A Certificate giving the last date of kidding, signed by the owner of the Goat exhibited, or his Agent, must in every case be brought to the Steward of Goats as soon as possible after the animal has arrived in the Showyard.

The milk yielded by Goats in the Showyard shall be the property of the Society.

THE PRESIDENT'S CHAMPION MEDALS

A Champion Medal is given by THE LORD BLYTHSWOOD, K.C.V.O., President of the Society, for the *best Animal* in each of the following sections :—

- | | | | |
|--|---|---|--|
| 1. Shorthorn.
2. Aberdeen-Angus.
3. Galloway.
4. Belted Galloway.
5. Highland.
6. Dairy Shorthorn.
7. Ayrshire.
8. British-Friesian.
9. Red Poll.
10. Fat Cattle. | 11. Clydesdale Stallion.
12. Draught Gelding.
13. Clydesdale Mare or Filly.
14. Hunter.
15. Hackney.
16. Pony.
17. Highland Pony.
18. Western Island Pony.
19. Shetland Pony. | 20. Harness Horse.
21. Draught Gelding in Harness.
22. Blackface Sheep.
23. Cheviot.
24. Border Leicester.
25. Half-bred.
26. Oxford-Down.
27. Suffolk.
28. Shropshire. | 29. Dorset Horn.
30. Goat.
31. Large White Pig.
32. Middle White.
33. Berkshire.
34. Large Black.
35. Cumberland.
36. Large White Ulster. |
|--|---|---|--|

NOTE.—Animals entered as *Extra Stock* may compete for these Medals. Former Winners of the President's Medals are eligible. The Society shall have the right to photograph the Winners for publication in the 'Transactions.' At this Show no animal can be awarded more than one of these Medals.

ENTRY FEES		CLASS	* CATTLE				PREMIUMS			
Members	Non-Members		SHORTHORN				First	Second	Third	Fourth
			Judges : James Fenwick, J. H. Toppin							
			<i>President's Medal for best Shorthorn</i>							
			¹ Tweeddale Gold Medal for best Shorthorn Bull.				£	£	£	£
			² The Duthie Perpetual Challenge Cup, value £150, for best Animal in the Shorthorn Classes, "Extra Stock" being eligible to compete.							
25/-	45/-	1	Bull born before 1st December 1922				15	10	5	3
25/-	45/-	2	Bull born on or after 1st December 1922 and before 1st April 1923				15	10	5	3
25/-	45/-	3	Bull born on or after 1st April 1923, and not later than 30th November 1923				12	8	4	2
25/-	45/-	4	Bull born on or after 1st December 1923, and not later than 31st March 1924				12	8	4	2
25/-	45/-	5	Bull born on or after 1st April 1924.				10	6	4	2
			³ The Emilio R. Casares, jun., "Junior Champion Cup," value £50, for best Shorthorn Bull in Class 5, calved on or after 1st April of the year preceding the Show, that has passed the tuberculin test.							
			⁴ Best Shorthorn Bull in the Show, entered or eligible for entry in Coates's Herd-Book—£20.							
			⁴ Silver Medal to the Breeder of the winner of above Prize.							
			Breeder of best Bull of any age in the five Classes—The Silver Medal.							

* See Rules 32 and 33.

¹ Annual Free Income from Fund of £500.

³ This Cup was gifted by the late Mr William Duthie, Collynie. The Cup may not be won on more than one occasion with the same animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica as a memento of his winning the Cup.

⁴ Given by Mr Emilio R. Casares, jun. This Cup will become the property of the Exhibitor who shall win it three times, not necessarily in succession. A Silver Medal will be awarded to the winner each year.

⁴ Given by the Shorthorn Society.

ENTRY FEES		CLASS	CATTLE	PREMIUMS					
Members	Non-Members			First	Second	Third	Fourth		
SHORTHORN—continued									
25/-	45/-	6	Cow born before 1st December 1922, in Milk	£ 12	£ 8	£ 4	£ 2		
25/-	45/-	7	Cow or Heifer born on or after 1st Dec. 1922	10	5	3	2		
25/-	45/-	8	Heifer born on or after 1st Dec. 1923 and not later than 31st March 1924	10	5	3	2		
25/-	45/-	9	¹ Heifer born on or after 1st April 1924	10	5	3	2		
			² Best Shorthorn Female in the Show, entered or eligible for entry in Coates's Herd-Book—£20.						
			² Silver Medal to the Breeder of the winner of above Prize.						
PRIZE MONEY BY SOCIETY				£206					
CONTRIBUTED PRIZES				60					
ABERDEEN-ANGUS									
Judges : James Beddie, F. G. McConachie									
<i>President's Medal for best Aberdeen-Angus Animal</i>									
25/-	45/-	10	Bull born before 1st Dec. 1922	15	10	5	3		
25/-	45/-	11	Bull born on or after 1st Dec. 1922	15	10	5	3		
25/-	45/-	12	Bull born on or after 1st Dec. 1923	12	8	4	2		
			³ Ballindalloch Challenge Cup, value £50, for the best Bull of any age in the three Classes.						
			Breeder of best Bull of any age in the three Classes—The Silver Medal.						
			Breeder of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.						
25/-	45/-	13	Cow in Milk born before 1st Dec. 1921	12	8	4	2		
25/-	45/-	14	Cow in Milk born on or after 1st Dec. 1921.	12	8	4	2		
25/-	45/-	15	Cow or Heifer born on or after 1st Dec. 1922	10	5	3	2		
			³ Ballindalloch Challenge Cup, value £50, for the best Cow of any age in the above Classes.						
			Breeder of the Winner of the Ballindalloch Challenge Cup—The Silver Medal.						
25/-	45/-	16	Heifer born on or after 1st Dec. 1923 and before 1st March 1924	10	5	3	2		
25/-	45/-	17	Heifer born on or after 1st March 1924	10	5	3	2		
			⁴ Champion Gold Medal for best Animal in the Breeding Classes, breeding animals shown as "Extra Stock" being eligible to compete.						
PRIZE MONEY BY SOCIETY				£204					

¹ Given by Scottish Shorthorn Breeders' Associations.² Given by the Shorthorn Society.³ "The Ballindalloch Challenge Cups," value £50 each, are offered for the best Bull of any age and best Cow of any age (Heifers excluded) in the Aberdeen-Angus classes, the former presented by the late Sir George Macpherson Grant, Bart., and the latter by the late Sir John Macpherson Grant, Bart. Each Cup will become the property of the Exhibitor who shall win it five times, not necessarily in succession. The breeder of the successful animals each year will receive the Society's Silver Medal, with suitable inscription.⁴ Given by the Aberdeen-Angus Cattle Society.

ENTRY FEES			CLASS	CATTLE GALLOWAY	Judge : James Clark	President's Medal for best Galloway	PREMIUMS			
Members	Non-Members	First					Second	Third	Fourth	
							£	£	£	£
1 Dr Gillespie Memorial Challenge Trophy, value £50, for best Galloway Animal in the Breeding Classes, breeding animals shown as "Extra Stock" being eligible to compete—see conditions below.										
25/-	45/-	18	Bull born before 1st Dec. 1922	.	.	.	15	10	5	3
25/-	45/-	19	Bull born on or after 1st Dec. 1922	.	.	.	15	10	5	3
25/-	45/-	20	Bull born on or after 1st Dec. 1923	.	.	.	12	8	4	2
Breeder of best Bull of any age in the three Classes—The Silver Medal.										
25/-	45/-	21	Cow of any age in Milk	.	.	.	12	8	4	2
25/-	45/-	22	Cow or Heifer born on or after 1st Dec. 1922	.	.	.	10	5	3	2
25/-	45/-	23	Heifer born on or after 1st Dec. 1923	.	.	.	10	5	3	2
PRIZE MONEY BY SOCIETY . £158										
BELTED GALLOWAY										
Judge : William Hyslop										
President's Medal for best Belted Galloway Animal										
2 Knockbrex Challenge Cup, value £50, for the best Belted Galloway Animal, "Extra Stock" being eligible to compete.										
25/-	45/-	24	Bull born before 1st December 1923	.	.	.	8	4	2	—
25/-	45/-	25	Bull born on or after 1st December 1923	.	.	.	8	4	2	—
25/-	45/-	26	Cow or Heifer born before 1st December 1922, in Milk or in Calf; if in calf, to calve on or before 1st December of the year of the Show	.	.	.	8	4	2	—
25/-	45/-	27	Heifer born on or after 1st December 1922	.	.	.	8	4	2	—
25/-	45/-	28	Heifer born on or after 1st December 1923	.	.	.	8	4	2	—
PRIZE MONEY BY SOCIETY . £35										
3 CONTRIBUTED PRIZES . 35										

¹ This Trophy is offered by the Galloway Cattle Society of Great Britain and Ireland (subject to the conditions of that Society) for the best Galloway animal registered in the Galloway Herd-Book, entered in any of the breeding classes, at the Show or Shows at which it may be competed for. The winner of the Trophy shall, before delivery thereof is made to him, give security to the Galloway Cattle Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive the Galloway Cattle Society's Silver Medal as a memento of his winning the Trophy.

² This Cup is offered by Mrs Brown of Knockbrex for the best Belted Galloway animal registered in the Dun and Belted Galloway Cattle Breeders' Association Herd-Book, entered in any of the breeding classes, at the Show or Shows at which it may be competed for. The winner of the Trophy shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive a Silver Medal as a memento of his winning the Trophy.

³ Contributed by the Dun and Belted Galloway Cattle Breeders' Association.

ENTRY FEES		CLASS	PREMIUMS			
Members	Non-Members		First	Second	Third	Fourth
			£	£	£	£
CATTLE						
HIGHLAND						
Judge: Peter M'Intyre						
<i>President's Medal for best Highland Animal</i>						
¹ Renfrewshire Perpetual Gold Challenge Cup, value £250, for best Highland Animal, "Extra Stock" being eligible to compete.						
25/-	45/-	29	Bull born before 1923	15	10	5 3
25/-	45/-	30	Bull born in 1923	15	10	5 3
25/-	45/-	31	Bull born in 1924	12	8	4 2
² Perpetual Victory Challenge Cup, approximate value 50 Guineas, for the best Animal in the Male Classes, "Extra Stock" being eligible to compete.						
Breeder of best Bull of any age in the three Classes—The Silver Medal.						
25/-	45/-	32	Cow of any age in Milk	12	8	4 2
25/-	45/-	33	Cow or Heifer born in 1922	10	5	3 2
25/-	45/-	34	Heifer born in 1923	10	5	3 2
² Perpetual Victory Challenge Cup, approximate value 35 Guineas, for the best Animal in the Female Classes, "Extra Stock" being eligible to compete.						
PRIZE MONEY BY SOCIETY			£158			

¹ This Cup, along with an endowment of £500, was provided from money collected in Renfrewshire by the late Provost Muir MacKean of Paisley, and is in commemoration of the Society's first Show in the county of Renfrew in 1913. This year the Cup is offered for the best Highland animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

² Given by the Highland Cattle Society of Scotland.

ENTRY FEES		CLASS		PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
CATTLE							
* DAIRY SHORTHORN							
Judge : Archibald Ritson							
<i>President's Medal for best Dairy Shorthorn</i>							
25/-	45/-	35	¹ Dairy Shorthorn Cow in Milk, born in or before 1921, eligible for and entered in Coates's Herd-Book, or pedigree sent for such entry previous to the Show—see Regulations below . . .	10	5	3	2
			¹ Silver Medal to the Breeder of the winner of First Prize.				
25/-	45/-	36	¹ Dairy Shorthorn Cow [or Heifer] in Milk, born in or after 1922, eligible for and entered in Coates's Herd-Book, or pedigree sent for such entry previous to the Show—see Regulations below . . .	10	5	3	2
			¹ Silver Medal to the Breeder of the winner of First Prize.				
25/-	45/-	37	² Dairy Shorthorn Bull, born in 1924, entered or Pedigree accepted for entry in Coates's Herd-Book. No Bull is eligible to compete unless registered or accepted for registration in the Year-Book of the Dairy Shorthorn Association . . .	10	5	3	2
[The Prizes will not be awarded unless there are at least three individual exhibitors in each of the three Classes.]							
PRIZE MONEY BY SOCIETY . . .				£25			
CONTRIBUTED PRIZES . . .				35			

*** REGULATIONS FOR DAIRY SHORTHORN CLASSES.**

The Shorthorn Dairy Cows in Classes 35 and 36 will be milked dry at 6 o'clock on the evening previous to the opening of the Show, in the presence of, and to the satisfaction of, the Steward of Cattle or a representative of the Society duly authorised by him, and will be milked in the ring on the first morning of the Show in the presence of the Judge, who shall see the milk weighed, and any animal that does not yield up to the following standard shall not be awarded a prize.

	Having calved within 2 Calendar Months.	Having calved between 2 & 3 Calendar Months.	Having calved more than 3 Calendar Months.
Cows, 5 years and upwards at date of calving . . .	30 lb.	27 lb.	24 lb.
Cows, 4 years and under 5 years do. . .	26 lb.	23 lb.	20 lb.
Cows [or Heifers], 3 years and under 4 years do. . .	22 lb.	19 lb.	16 lb.
Cows [or Heifers], under 3 years old do. . .	18 lb.	15 lb.	12 lb.

¹ First Prizes and Silver Medals given by the Shorthorn Society. No animal winning these prizes is eligible to compete again the same year, except at the Royal Agricultural Society's Show.

² First and Second Prizes given by Dairy Shorthorn Association

ENTRY FEES		CLASS	CATTLE AYRSHIRE	PREMIUMS		
Members	Non-Members			First	Second	Third
			<p>Judges : George Dunlop, John Young</p> <p>1. To be eligible for competition in the Ayrshire Classes Cows must have an authenticated Milk Yield, and younger Females and Bulls an authenticated Milking Pedigree, of a definite minimum amount.</p> <p>2. The minimum amount referred to shall be as follows, calculated on the basis of a period between calvings of 52 weeks, and 3·8 per cent of butter fat :—</p> <p>(a) Cows which have completed two or more lactations—700 gallons.</p> <p>(b) Cows which have completed only one lactation—600 gallons.</p> <p>(c) Younger Females and Bulls—an authenticated Milking Pedigree for dam and dam of sire on a similar basis.</p> <p>3. In the case of Cows with two or more lactations the record lodged may be that for any year the Exhibitor may select.</p> <p>4. The evidence of Milk Yield and Milking Pedigree shall be in the form of a Certificate signed by the Secretary of the Scottish Milk Records Association. The Certificate, besides giving the actual yields, shall give these calculated on a uniform basis of a period of 52 weeks between calvings, and 3·8 per cent butter fat. This latter figure shall be communicated to the Judges before adjudicating.</p> <p>5. The authenticated Milk Yields and authenticated Milking Pedigrees shall appear in the Catalogue.</p> <p><i>N.B.—Certificates above referred to must be lodged with Entries.</i></p> <p><i>President's Medal for best Ayrshire</i></p> <p>¹ Fife and Kinross Perpetual Gold Challenge Cup, value £200, for best Ayrshire Animal, "Extra Stock" being eligible to compete.</p> <p>² Cowhill Champion Cup, approximate value £30, for best Animal of the Ayrshire breed, entered with a number in the Herd-Book. The Cup to be won three times, not necessarily in succession, by the same person with different animals, before becoming the property of the winner.</p> <p>³ Cow in Milk,* born before 1922 12 8 4</p> <p>³ Cow in Milk,* born on or after 1st Jan. 1922 10 7 3</p> <p>³ Cow of any age in Calf,* and due to calve before 1st Dec. of the year of the Show 10 7 3</p> <p>^{25/-} 45/- ⁴¹ Heifer born in or after 1922, in Calf and due to calve before 1st Dec. of the year of the Show 10 7 3</p> <p>^{25/-} 45/- ⁴² Heifer born in 1923 10 5 3</p> <p>^{25/-} 45/- ⁴³ Heifer born in 1924 8 5 3</p> <p>⁴ Special Prize of £10 for the best Female Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book not later than 1st June 1925.</p>			

¹ This Cup, along with an endowment of £400, was subscribed for by the Counties of Fife and Kinross in commemoration of the Society's first Show at Cupar-Fife in 1912. This year the Cup is offered for the best Ayrshire animal. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

² Presented by Major Henry Keswick, Cowhill Tower, Dumfries, to Ayrshire Cattle Herd-Book Society, to be competed for annually at the Shows of the Highland and Agricultural Society of Scotland.

³ Cows in these Classes must have produced a calf within fifteen months prior to the Show.

⁴ Given by the Ayrshire Cattle Herd-Book Society.

* See Rule 72.

ENTRY FEES		CLASS		PREMIUMS		
Members	Non-Members			First	Second	Third
			CATTLE			
			AYRSHIRE—continued			
25/-	45/-	44	Bull born before 1923	12	8	4
25/-	45/-	45	Bull born in 1923	10	7	3
25/-	45/-	46	Bull born in 1924	8	5	3
			Breeder of best Bull of any age in Classes 44, 45, and 46—The Silver Medal.			
			¹ Special Prize of £10 for the best Male Animal of the Ayrshire breed entered with a number in the Ayrshire Cattle Herd-Book not later than 1st June 1925.			
			PRIZE MONEY BY SOCIETY	£178		
			CONTRIBUTED PRIZES	20		
			BRITISH FRIESIAN			
			Judges : Alexander Munro, Alexander Wilson			
			<i>President's Medal for best British Friesian Animal</i>			
			² The MacRobert Champion Silver Bell, value 50 Guineas, for the best Animal in the British Friesian Classes, registered in or eligible for entry in the British Friesian Cattle Herd-Book, "Extra Stock" being eligible to compete.			
45/-	65/-	47	³ Cow in Milk,* born in or before 1921	10	5	3
45/-	65/-	48	Cow in Calf, and not in Milk, born in or before 1921	10	5	3
45/-	65/-	49	Cow in Milk, born in 1922 or 1923	10	5	3
25/-	45/-	50	Heifer born in 1923	10	5	3
25/-	45/-	51	Heifer born in 1924, before 1st July	10	5	3
25/-	45/-	52	Heifer born in 1924, on or after 1st July	10	5	3
			Champion Prize of £5 given by the British Friesian Cattle Society for the best Female exhibited.			
25/-	45/-	53	Bull born in or before 1922	10	5	3
25/-	45/-	54	Bull born in 1923	10	5	3
25/-	45/-	55	Bull born in 1924	10	5	3
			Breeder of Best Bull of any age in Classes 53, 54, and 55—The Silver Medal.			
			Champion Prize of £5 given by the British Friesian Cattle Society for the best Male exhibited.			
			PRIZE MONEY BY SOCIETY	£108		
			⁴ CONTRIBUTED PRIZES	64		

¹ Given by the Ayrshire Cattle Herd-Book Society.

² Presented by Lady Rachel Workman MacRobert, Douneside, Tarland. This Bell will become the property of the Exhibitor who shall win it three times, not necessarily in succession. The winner of the Bell on each occasion will receive a miniature replica in silver as a memento of winning the Bell. The Breeder of the winning animal will also receive a replica, provided he is not also the Exhibitor.

³ Cows in this Class must have produced a calf within fifteen months prior to the Show.

⁴ Contributed by the British Friesian Cattle Society.

* See Rule 72.

ENTRY FEES		CLASS	CATTLE		PREMIUMS			
Members	Non-Members				First	Second	Third	
					£	£	£	
			Judge: Herbert Blofield					
			<i>President's Medal for best Red Poll Animal</i>					
			¹ Kinmount Challenge Cup, value about £50, for the best Female Animal in the Red Poll Classes registered in the Red Poll Cattle Society's Herd-Book, "Extra Stock" being eligible to compete.					
25/-	45/-	56	² Cow in Milk, born before 1923	.	.	10	5	3
25/-	45/-	57	Heifer born in 1923	.	.	10	5	3
25/-	45/-	58	Heifer born in 1924	.	.	10	5	3
25/-	45/-	59	Bull born in or before 1923	.	.	10	5	3
25/-	45/-	60	Bull born in 1924	.	.	10	5	3
			PRIZE MONEY BY SOCIETY		£60			
			³ CONTRIBUTED PRIZES		30			
FAT CATTLE								
			Judges: James Beddie, J. Fenwick					
			<i>President's Medal for best Fat Animal</i>					
25/-	45/-	61	Ox, any pure breed or cross, born after 1st Dec. 1922	.	.	7	3	-
25/-	45/-	62	Ox, any pure breed or cross, born after 1st Dec. 1923	.	.	7	3	-
25/-	45/-	63	Heifer, any pure breed or cross, born after 1st Dec. 1922	.	.	7	3	-
25/-	45/-	64	Heifer, any pure breed or cross, born after 1st Dec. 1923	.	.	7	3	-
			PRIZE MONEY BY SOCIETY		£40			
[Exhibitors of Fat Cattle are requested to state the breed of the sire and dam when making their entries.]								
<hr/>								
			PRIZE MONEY BY SOCIETY		£1172 0			
			CONTRIBUTED		244 0			
			CUPS, MEDALS, &c.		1106 15			
			Total Prizes for Cattle		£2522 15			
<hr/>								
[See Note as to EXTRA STOCK, p. 104.]								

¹ This Cup was presented to the Society by Lieut.-Colonel Charles Brook of Kinmount, Annan. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so.

² Cows in this Class must have 1

³ Contributed by Red Poll Cattle Society.

ENTRY FEES		CLASS	PREMIUMS			
Members	Non-Members		First	Second	Third	Fourth
			£	£	£	£
* HORSES						
FOR AGRICULTURAL PURPOSES						
DRAUGHT STALLIONS						
Judges: John Cocker, John Leckie, Robert Park, Andrew Renwick (Buchley), Andrew Renwick (Skateraw), James Weir						
(Three will judge Males and three Females, this being decided by ballot in the Showyard)						
<i>President's Medal for best Clydesdale Stallion or Colt</i>						
55/-	75/-	65	Stallion born before 1922	20	15	10 4
55/-	75/-	66	Entire Colt born in 1922	20	15	10 4
55/-	75/-	67	Entire Colt born in 1923	20	15	10 4
40/-	60/-	68	Entire Colt born in 1924	15	10	6 4
¹ William Taylor Memorial Prize of £10 and Certificate to the breeder of the best Clydesdale Colt entered in Classes 67 or 68.						
Breeder of best Male Animal of any age in Classes 65, 66, 67, and 68—The Silver Medal.						
PRIZE MONEY BY SOCIETY . £182						
CONTRIBUTED PRIZE . 10						
DRAUGHT GELDINGS						
Judges: Same as Stallions						
<i>President's Medal for best Draught Gelding</i>						
40/-	60/-	69	Draught Gelding born before 1922	10	5	3 -
40/-	60/-	70	Draught Gelding born in 1922	8	5	3 -
40/-	60/-	71	Draught Gelding born in 1923	8	5	3 -
PRIZE MONEY BY SOCIETY . £50						

* For prizes given by the Society, no animal is allowed to compete in more than one Class, except that horses entered in other Classes may also compete in the Jumping and Harness Classes.

¹ Given by William Taylor Memorial Committee.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

ENTRY FEES		CLASS	PREMIUMS			
Members	Non-Members		First	Second	Third	Fourth
			£	£	£	£
HORSES						
DRAUGHT MARES AND FILLIES						
Judges : Same as Stallions, page 91						
<i>President's Medal for best Clydesdale Mare or Filly</i>						
¹ Paisley Perpetual Gold Challenge Cup, value £300, for best Clydesdale Mare or Filly, "Extra Stock" being eligible to compete.						
55/-	75/-	72	Mare of any age, with Foal at foot	20	12	7 4
40/-	60/-	73	Yeld Mare born before 1922	12	9	6 4
40/-	60/-	74	Yeld Mare or Filly born in 1922	12	9	6 4
40/-	60/-	75	Filly born in 1923	12	9	6 4
40/-	60/-	76	Filly born in 1924	12	9	6 4
² Cawdor Challenge Cup, value 50 guineas, for best Clydesdale Mare or Filly.						
PRIZE MONEY BY SOCIETY .			£167			
Total Prize Money for Draught Horses, £409						

¹ This Cup, along with an endowment of £600, was provided from money collected in Paisley by the late Provost Muir M'Kean, and is in commemoration of the Society's first Show at Paisley in 1918. This year the Cup is offered for the best Clydesdale Mare or Filly. The animal winning the Cup must be certified free from hereditary disease. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner of the Cup on each occasion will receive a miniature replica in silver as a memento of his winning the Cup.

² This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland (subject to the conditions of that Society) for the best Clydesdale Mare or Filly registered in the Clydesdale Stud-Book, entered in any of the Draught Horse Classes, at the Show at which it may be competed for. The Cup must be won four times by an Exhibitor with different animals (but not necessarily in consecutive years) before it becomes his absolute property. The animal winning this Cup must be certified free from hereditary disease. The winner of the Cup, other than the absolute winner, shall, before delivery thereof is made to him, give security to the Clydesdale Horse Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. Until the Cup be won outright, the winner on each occasion will receive the Clydesdale Horse Society's Silver Medal as a memento of his winning the Cup.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 39.

ENTRY FEES		CLASS	HORSES	PREMIUMS		
Members	Non-Members			First	Second	Third
				£	£	£
			HORSES			
			HUNTERS			
			Judges: C. H. Herdman, E. W. Hope-Johnstone			
			(Classes 77 to 80 to be judged at 1.30 P.M. on Tuesday, 14th July)			
			<i>President's Medal for best Hunter in Classes 77 to 83 inclusive</i>			
55/-	75/-	77	Hunter Brood Mare, with Foal at foot	15	7	3
40/-	60/-	78	Yeld Mare, Filly, or Gelding born in 1922—in hand	10	5	3
40/-	60/-	79	Yeld Mare, Filly, or Gelding born in 1923—in hand	10	5	3
40/-	60/-	80	Colt, Gelding, or Filly born in 1924, the produce of thoroughbred Stallion or registered Hunter sire, out of Mare of any breed	10	5	3
			(Classes 81 to 84 to be judged in Parade Ring on Tuesday, immediately after Clydesdales).			
40/-	60/-	81	Mare or Gelding born in or before 1921, to carry 14 stone 7 lb. and upwards—in saddle	15	10	5
40/-	60/-	82	Mare or Gelding born in or before 1921, to carry 12 stone 7 lb. and under 14 stone 7 lb.— in saddle	15	10	5
40/-	60/-	83	Mare or Gelding born in or before 1921, to carry under 12 stone 7 lb.—in saddle	15	10	5
40/-	60/-	84	Hack of Hunter Type born in or before 1921, 15.2 hands and under—in saddle	8	5	3
			¹ Best Hunter Filly, not exceeding three years old, registered with a number in the Hunter Stud- Book, or the entry tendered within a month of the award—Champion Gold Medal.			
			Leaping (Wednesday evening, 15th July), confined to Horses the property of a subscriber to any recognised Pack of Hounds in Scotland, and which have been fairly ridden to hounds in any country during season 1924-1925 by the owner. (Premiums, £10, £8, £5, £3, £2). (See page 98.)			
			PRIZE MONEY BY SOCIETY	£135		
			² CONTRIBUTED PRIZES	50		

¹ Given by the Hunters' Improvement and National Light Horse Breeding Society.² £50 of above prize-money contributed by persons interested.

**Stallions and Colts, 2 years old and upwards, must be licensed
for stud purposes. See Rule 39.**

ENTRY FEES			CLASS	PREMIUMS		
Members	Non-Members	First		Second	Third	
		£		£	£	
HORSES						
HACKNEYS						
Judge : Thomas Prentice						
(All to be shown in hand)						
(To be judged at 2.30 P.M. on Tuesday, 14th July)						
President's Medal for best Hackney in Classes 85 to 87						
55/-	75/-	85	Brood Mare, over 14 hands, with Foal at foot, or to foal this season to a registered sire . . .	10	6	4
40/-	60/-	86	Yeld Mare or Filly born in or after 1922 . . .	8	5	3
55/-	75/-	87	Stallion born in or before 1922, over 14 hands . . .	10	6	4
[All animals entered in the above Hackney Classes must be registered in the Hackney Stud-Book except Yearlings in Class 86, which must be eligible for entry. Entry forms must be accompanied by certificate to this effect from the Secretary, 12 Hanover Square, London, W.]						
PRIZE MONEY BY SOCIETY . . .				£56		
PONIES						
Judge : Thomas Prentice						
President's Medal for best Pony						
40/-	60/-	88	Stallion, 3 years old and upwards, 14 hands and under—in hand . . .	5	3	2
40/-	60/-	89	Yeld Mare, Filly, or Gelding, 3 years old and upwards, 14 hands and under—in saddle . . .	5	3	2
PRIZE MONEY BY SOCIETY . . .				£20		
¹ HIGHLAND PONIES						
Judge : John M. Macdonald						
President's Medal for best Highland Pony						
(To be judged at 1.30 P.M. on Tuesday, 14th July)						
40/-	60/-	90	Stallion born before 1923, not exceeding 14.2 hands . . .	8	4	2
40/-	60/-	91	Mare born before 1923, not exceeding 14.2 hands, yeld or with Foal at foot . . .	8	4	2
40/-	60/-	92	Entire Colt born on or after 1st January 1923 . . .	6	4	2
40/-	60/-	93	Filly born on or after 1st January 1923 . . .	6	4	2
² Special Prize of £10 for the best Highland Stallion, Mare, Colt, or Filly, entered or accepted for entry in the Highland Section of the National Pony Stud-Book, "Extra Stock" being eligible to compete. Competition to be strictly confined to animals passed sound and free from hereditary disease.						
PRIZE MONEY BY SOCIETY . . .				£12		
CONTRIBUTED PRIZES . . .				50		

¹ The Board of Agriculture for Scotland gives £40 towards prizes for Highland Ponies.

² £10 given by the National Pony Society and £10 by the Highland Pony Society.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 38.

ENTRY FEES		CLASS	HORSES	PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
HORSES							
WESTERN ISLAND PONIES							
Judge : Colin Campbell							
(To be judged at 1.30 P.M. on Tuesday, 14th July)							
<i>President's Medal for best Western Island Pony</i>							
40/-	60/-	94	Stallion born before 1923, not exceeding 14 hands .	8	4	2	—
40/-	60/-	95	Mare born before 1923, not exceeding 14 hands, yield or with Foal at foot .	8	4	2	—
40/-	60/-	96	Entire Colt born on or after 1st January 1923 .	6	4	2	—
40/-	60/-	97	Filly born on or after 1st January 1923 .	6	4	2	—
¹ Special Prize of £10 for the best Western Island Stallion, Mare, Colt, or Filly, entered or accepted for entry in the Highland Section of the National Pony Stud-Book, "Extra Stock" being eligible to compete. Competition to be strictly confined to animals passed sound and free from hereditary disease.							
PRIZE MONEY BY SOCIETY . . .				£52			
CONTRIBUTED PRIZES . . .				10			
SHETLAND PONIES							
Judges : W. A. Aitkenhead, J. F. Christie							
(To be judged at 1.30 P.M. on Tuesday, 14th July)							
(All to be shown in hand)							
<i>President's Medal for best Shetland Pony</i>							
35/-	55/-	98	Stallion, not exceeding 10½ hands, born before 1922	8	5	3	2
35/-	55/-	99	Entire Colt, not exceeding 10½ hands, born in 1922 or 1923	8	5	3	2
35/-	55/-	100	Mare, not exceeding 10½ hands, with Foal at foot .	8	5	3	2
35/-	55/-	101	Yeld Mare, not exceeding 10½ hands .	8	5	3	2
35/-	55/-	102	Filly, not exceeding 10½ hands, born in 1922 or 1923	8	5	3	2
² Silver Cup for best Shetland Pony of either sex and any age, drawn from ordinary Classes—and shown in saddle. (To be judged by Hunter Judge.)							
³ Best Group of Shetland Ponies, consisting of one male and two females, of any age, entered in above Classes							
				10	—	—	—
⁴ Silver Medal for the best Shetland Pony of the sex opposite to that of the winner of the President's Medal, entered or eligible for entry in the Shetland Pony Stud-Book.							
PRIZE MONEY BY SOCIETY . . .				£90			
CONTRIBUTED PRIZES . . .				10			

¹ £10 given by the National Pony Society and £10 by the Highland Pony Society.

² Given by a past President of the Shetland Pony Stud-Book Society.

³ Given by "Five Lovers of the Breed," per Mr W. Mungall of Transy.

⁴ Given by the Shetland Pony Stud-Book Society.

Stallions and Colts, 2 years old and upwards, must be licensed for stud purposes. See Rule 35.

ENTRY FEES		CLASS	HORSES RIDING PONIES	PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
			(To be judged by Hunter Judges at 4 P.M. on Wednesday, 15th July)	£	£	£	£
5/-	10/-	103	Mare or Gelding, any age, over 12 hands and not exceeding 14 hands, in saddle, to be ridden by boy or girl 10 years and under 14 years of age on first day of Show	5	3	2	—
5/-	10/-	104	Mare or Gelding, any age, not exceeding 12 hands, in saddle, to be ridden by boy or girl under 10 years of age on first day of Show	5	3	2	—
			PRIZE MONEY BY SOCIETY				
					£20		
			[Ponies in Classes 103 and 104 must be in the Showyard not later than 3 P.M. on Wednesday, and may leave immediately after the Afternoon Parade on Thursday.]				
			¹ HORSES IN HARNESS				
			Judges : R. G. Heaton, Thomas Prentice				
			(All animals to be driven in the Parade Ring)				
			² President's Medal for best animal in the Classes for Horses in Harness				
			³ The "Glasgow" Champion Challenge Cup, value £50, for best Horse in Single Harness, limited to First, Second, and Third Prize-Winners in Harness Classes, and animals entered as "Extra Stock." The First Reserve will receive £5, the Second £4, the Third £3, the Fourth £2.				
			(To be judged at 4 P.M. on Thursday, 16th July)				
			OPEN CLASSES				
			(To be judged at 11 A.M. on Wednesday, 15th July)				
40/-	60/-	105	Yield Mare, Filly, or Gelding, any age, in Harness, exceeding 15 hands, to be driven in the ring	15	10	6	3
40/-	60/-	106	Yield Mare, Filly, or Gelding, any age, in Harness, over 14 hands and not exceeding 15 hands, to be driven in the ring	15	10	6	3
40/-	60/-	107	Yield Mare, Filly, or Gelding, any age, not exceeding 14 hands, to be driven in the ring	15	10	6	3

¹ Animals entered in other Classes may be entered in the Harness Classes at an additional fee of 5s. if they are eligible.

² An animal that has won a President's Medal in another section in this Show shall not be eligible to compete for the Medal in this section.

³ The "Glasgow" Challenge Cup is offered for the best Horse in Single Harness, and will become the property of the Exhibitor who shall win it three times, not necessarily in succession. The winner of the Cup shall, before delivery thereof is made to him, give security to the Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. The winner on each occasion will receive a silver memento of his winning the Cup.

Shed accommodation for machines for Driving Competitions—Members, 10s.; Non-Members, 20s.

ENTRY FEES		CLASS	HORSES		PREMIUMS			
Members	Non-Members				First	Second	Third	Fourth
			HORSES IN HARNESS—continued		£	£	£	£
			NOVICE CLASSES ¹					
			(To be judged at 4 P.M. on Tuesday, 14th July)					
40/-	60/-	108	Yeld Mare, Filly, or Gelding , any age, in Harness, exceeding 15 hands, which has never won a First Prize exceeding the value of £10 at any Show prior to 1st January 1925 (Sales excluded).		12	8	6	3
40/-	60/-	109	Yeld Mare, Filly, or Gelding , any age, in Harness, over 14 hands and not exceeding 15 hands, which has never won a First Prize exceeding the value of £10 at any Show prior to 1st January 1925 (Sales excluded).		12	8	6	3
40/-	60/-	110	Yeld Mare, Filly, or Gelding , any age, in Harness, not exceeding 14 hands, which has never won a First Prize exceeding the value of £10 at any Show prior to 1st January 1925 (Sales excluded).		12	8	6	3
			CONSOLATION CLASS					
			(To be judged at 4 P.M. on Thursday, 16th July)					
—	—	111	Yeld Mare, Filly, or Gelding , any height, drawn from foregoing Classes, and which has not won a Prize in Classes 105 to 110.		6	4	3	2
			[Horses in Harness Classes, except Novice Classes, must be in Showyard not later than Tuesday evening, judged on Wednesday and Thursday, and may leave the Showyard on Thursday immediately after Afternoon Parade. Horses entered in the Novice Classes must be in the Showyard not later than 8 a.m. on Tuesday.]					
			PRIZE MONEY BY SOCIETY . . .		£118			
			CONTRIBUTED PRIZES . . .		100			
			DRAUGHT GELDINGS IN HARNESS					
			Judges: John Cocker, Robert Park					
			(To be judged at 11 A.M. on Thursday, 16th July)					
			President's Medal for best Gelding in Harness					
5/-	10/-	112	Draught Gelding , any age, in Harness, shown in Cart or Lorry (and driven by single driver), it being a condition that the Horse must have been regularly worked for a period of twelve weeks prior to the first day of the Show, the Horse to be exhibited on THURSDAY, 16th July 1925, only the Prize-Winners to take part as required in the Parade on Thursday. Prizes—£12, £10, £8, £6, £5, £4, £3, £2, £1.					
			TOTAL PRIZE MONEY . . .		£51			
			PRIZE MONEY BY SOCIETY . . .		£953 0			
			CONTRIBUTED . . .		230 0			
			CUPS, MEDALS, &c. . .		422 10			
			Total Prizes for Horses . . .		£1605 10			
			[See Note as to EXTRA STOCK, p. 104.]					

¹ £100 of the above prize-money and Challenge Cup contributed by persons interested.

JUMPING COMPETITIONS

SPECIAL REGULATIONS

(See also the Regulations on pages 68 to 75)

1. Jumping Competitions will take place on the afternoons of Wednesday, Thursday, and Friday, the 15th, 16th, and 17th July, and on the evenings of Wednesday and Thursday, 15th and 16th July.
2. Entries for each day's Competitions will close at the Secretary's Office in the Showyard at 6 p.m. on the preceding day. Entries for Evening Jumping may be received till the beginning of the Competition.
3. Entry Fees.—Wednesday, £1; Thursday and Friday, 10s. for each class. Evening Jumping, 10s.
4. Accommodation for jumping horses will be provided as follows: Covered shed in which to stand during the day free of charge; or, on application to the Secretary not less than ten days before the opening of the Show, stalls or loose-boxes will be provided at a charge (in addition to the Entry Fee) of £2 for a stall and £3 for a loose-box, which must be paid along with the Entry Fee at the time of application.
5. Horses entered for jumping only need not enter the Showyard till 12 noon on the day of Competition, and may leave the Showyard at the close of the jumping.
6. The Jumps may consist of Single Hurdle, Gate, Double Hurdle, Wall, and Water Jump, power being reserved by the Society to alter these, as well as the Handicaps, as may be thought desirable.

ENTRY FEE	CLASS		First	Second	Third	Fourth	Fifth
		WEDNESDAY.	£	£	£	£	£
20/-	1	Horse or Pony any height	20	15	10	5	3
		THURSDAY.					
10/-	2	Horse or Pony any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in Class 1	10	8	5	3	2
		FRIDAY.					
10/-	3	Horse or Pony any height, Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in either of Classes 1 or 2—4 inches extra for the winner of the two first prizes in Classes 1 and 2	10	8	5	3	2
		Champion Prize for most points in Prizes with one or more horses in above Classes—First Prize to count five points; Second Prize, four points; Third Prize, three points; Fourth Prize, two points; and Fifth Prize, one point—the money to be evenly divided in the event of a tie	10	—	—	—	—
		WEDNESDAY EVENING.					
10/-	4	Hunter, the property of a subscriber to any recognised Pack of Hounds in Scotland, and which has been fairly ridden to hounds in any country during season 1924-1925 by its owner. (The Judges to have power to decide whether or not Horses entered for this Competition have been fairly hunted)	10	8	5	3	2
		THURSDAY EVENING.					
10/-	5	Horse or Pony any height	10	8	5	3	2
		Total Prize Money for Jumping, £175					

Special Entry Forms for above Competitions to be had on application.

ENTRY FEES		CLASS		PREMIUMS			
Members	Non-Members			First	Second	Third	Fourth
				£	£	£	£
S H E E P							
*BLACKFACE							
Judges: D. M'Donald, Thomas Macmillan, William Sandilands							
<i>President's Medal for best animal of Blackface breed</i>							
15/-	25/-	113	Tup above one shear	12	8	4	2
15/-	25/-	114	Shearling Tup	12	8	4	2
15/-	25/-	115	Shearling Tup, which shall have been entirely out-wintered, and not housed or house-fed at any time, and not clipped <i>before</i> 21st May 1925	12	8	4	2
15/-	25/-	116	Tup Lamb	5	3	2	-
15/-	25/-	117	Ewe above one shear, with her Lamb at foot	10	5	2	-
15/-	25/-	118	Shearling Ewe or Gimmer	10	5	2	-
PRIZE MONEY BY SOCIETY				£122			
CHEVIOT							
Judges: Joshua Murray, Robert Shiel							
<i>President's Medal for best animal of the Cheviot breed</i>							
¹ Perpetual Challenge Cup, value £25, gifted by Mr J. Borthwick, for best Sheep in the Cheviot classes.							
15/-	25/-	119	Tup above one shear	12	8	4	2
15/-	25/-	120	Shearling Tup	12	8	4	2
15/-	25/-	121	Tup Lamb	5	3	2	-
15/-	25/-	122	Ewe above one shear, with her Lamb at foot	10	5	2	-
15/-	25/-	123	Shearling Ewe or Gimmer	10	5	2	-
PRIZE MONEY BY SOCIETY				£96			

* Formal Declarations must be made at time of entry that the conditions as regards clipping, &c., have been strictly adhered to.

¹ Given by Cheviot Sheep Society.

ENTRY FEES		CLASS	PREMIUMS			
Members	Non-Members		First	Second	Third	
			£	£	£	
* GOATS						
Judge · Captain H. D. J. K. Greenway						
<i>President's Medal for best animal in the Goat Classes</i>						
<i>(All animals must be registered)</i>						
1 Challenge Cup, value 20 Guineas, for the best Female Goat in the Show.						
2 Challenge Cup, value £10, for best Female Anglo-Nubian Goat over two years old, in Milk, entered in the Anglo-Nubian section of the Herd-Book, "Extra Stock" being eligible to compete.						
5/-	10/-	146	Male Goat, any variety, over two years	3	2	1
5/-	10/-	147	Male Goat, any variety, over one but not exceeding two years	3	2	1
5/-	10/-	148	Male Kid, any variety, not exceeding one year	3	2	1
5/-	10/-	149	Female Goat, Anglo-Nubian, in Milk	3	2	1
5/-	10/-	150	Female Goat, any other variety, in Milk	3	2	1
5/-	10/-	151	Goatling, any variety, over one but not exceeding two years	3	2	1
5/-	10/-	152	Female Kid, any variety, not exceeding one year	3	2	1
5/-	10/-	153	† Milking Competition, for quantity, open to Classes 149 and 150	3	2	1
NOTE.—No animal is allowed to compete in more than one Class, except that Goats entered in Classes 149 and 150 may also be entered in Class 153.						
PRIZE MONEY BY SOCIETY £36						
BOARD OF AGRICULTURE FOR SCOTLAND 12						
CUPS 31						
Total Prizes for Goats £79						
[See Note as to EXTRA STOCK, p. 104.]						

The Competition for Goats is recognised by the British Goat Society, 5 Fenchurch Street, London, E.C., which will give Challenge Certificates (qualifying for a Championship) for the best Male Goat over one year, for the best Female Goat over two years that has borne a kid, and for the best dual purpose Goat; a Breed Challenge Certificate for the best Anglo-Nubian Female Goat over two years that has borne a kid; a Bronze Medal for the best female exhibit in Classes 149, 150, 151, and 152; and a Bronze Medal for the best male exhibit in Classes 146, 147, and 148.

¹ Given by Lord Dewar, London—to be competed for annually.

² Given by Mrs S. Macdonald, Garrochty—to be competed for annually.

† The milk yielded by goats in this Class shall be the property of the Society.

* For Regulations see page 82.

ENTRY FEES		CLASS		PREMIUMS		
Members	Non-Members			First	Second	Third
				£	£	£
* PIGS						
LARGE WHITE						
Judge: George A. Bruce						
<i>(All Large White Pigs to be entered or eligible for entry in the Herd-Book of the National Pig-Breeders' Association)</i>						
<i>President's Medal for best Large White Pig</i>						
¹ Gold Medal, value £5, for the best Large White Boar in the Show.						
15/-	25/-	154	Boar born before 1924	8	4	2
15/-	25/-	155	Boar born in 1924	8	4	2
15/-	25/-	156	Boar born in 1925	6	3	1
¹ Gold Medal, value £5, for the best Large White Sow in the Show.						
15/-	25/-	157	Sow born before 1924	8	4	2
15/-	25/-	158	Sow born in 1924	8	4	2
15/-	25/-	159	Sow born in 1925	6	3	1
PRIZE MONEY BY SOCIETY				£76		
MIDDLE WHITE						
Judge: W. Hallas						
<i>(All Middle White Pigs to be entered or eligible for entry in the Herd-Book of the National Pig-Breeders' Association)</i>						
<i>President's Medal for best Middle White Pig</i>						
¹ Gold Medal, value £5, for the best Middle White Boar in the Show.						
15/-	25/-	160	Boar, any age	8	4	2
15/-	25/-	161	Boar born in 1925	6	3	1
¹ Gold Medal, value £5, for the best Middle White Sow in the Show.						
15/-	25/-	162	Sow born before 1924	8	4	2
15/-	25/-	163	Sow born in 1924	8	4	2
15/-	25/-	164	Sow born in 1925	6	3	1
PRIZE MONEY BY SOCIETY				£56		
¹ CONTRIBUTED PRIZES				6		
BERKSHIRE						
Judge: Alfred Mansell.						
<i>President's Medal for best Berkshire Pig</i>						
15/-	25/-	165	Boar, any age	8	4	2
15/-	25/-	166	Boar born in 1925	6	3	1
15/-	25/-	167	Sow, any age	8	4	2
15/-	25/-	168	Sow born in 1925	6	3	1
PRIZE MONEY BY SOCIETY				£48		

* See Rule 35.

¹ Given by the National Pig-Breeders' Association.

ENTRY FEES		CLASS	PIGS		PREMIUMS		
Members	Non-Members		LARGE BLACK		First	Second	Third
			Judge: A. T. Wright				
			<i>President's Medal for best Large Black Pig</i>				
			¹ Champion Cup , value £10, 10s., for the best Large Black Animal exhibited, "Extra Stock" being eligible to compete. The Cup to be won twice in succession or three times at intervals by the same exhibitor before it becomes his absolute property.		£	£	£
15/-	25/-	169	Boar	born before 1924	8	4	2
15/-	25/-	170	Boar	born in 1924	8	4	2
15/-	25/-	171	Boar	born in 1925	6	3	1
15/-	25/-	172	Sow	born before 1924	8	4	2
15/-	25/-	173	Sow	born in 1924	8	4	2
15/-	25/-	174	Sow	born in 1925	6	3	1
			PRIZE MONEY BY SOCIETY		£51		
			¹ CONTRIBUTED PRIZES		25		
			CUMBERLAND				
			Judge: A. H. Fox Brockbank				
			<i>President's Medal for best Cumberland Pig</i>				
15/-	25/-	175	Boar	any age	8	4	2
15/-	25/-	176	Boar	born in 1925	6	3	1
15/-	25/-	177	Sow	any age	8	4	2
15/-	25/-	178	Sow	born in 1925	6	3	1
			PRIZE MONEY BY SOCIETY		£28		
			² CONTRIBUTED PRIZES		20		
			LARGE WHITE ULSTER				
			Judge: John Wallace				
			<i>President's Medal for best Large White Ulster Pig</i>				
15/-	25/-	179	Boar	born before 1st September 1924	8	4	2
15/-	25/-	180	Boar	born on or after 1st September 1924	6	3	1
15/-	25/-	181	Sow	born before 1st September 1924	8	4	2
15/-	25/-	182	Sow	born on or after 1st September 1924	6	3	1
			PRIZE MONEY BY SOCIETY		£28		
			³ CONTRIBUTED PRIZES		20		
			PRIZE MONEY BY SOCIETY		£267	0	
			CONTRIBUTED		71	0	
			CUPS, MEDALS, &C.		30	10	
			Total Prizes for Pigs		£388	10	

¹ Given by Large Black Pig Society

- Given by the Cumberland Pig Breeders' Association.

³ Given by the Large White Ulster Pig Society**EXTRA STOCK**

(FORMER WINNERS AND STOCK NOT ELIGIBLE FOR ORDINARY CLASSES)

Animals not included in the Classes for Competition may be exhibited as Extra Stock, and may receive Awards as follows the Silver Medal, the Medium Silver Medal, and the Bronze Medal

Animals entered as Extra Stock are eligible to compete for the President's Medals, whether former winners of these Medals or not. They are also eligible to compete for Special Prizes where the conditions of these Prizes permit.

While every endeavour will be made to see that former winners are correctly entered in the Catalogue as "Extra Stock," the Society accepts no responsibility for this, it being the duty of Exhibitors to state clearly on the Entry Form the Show at which the animal became disqualified for the Ordinary Classes. If an animal appears in the Catalogue as entered in an Ordinary Class which should appear as "Extra Stock," it cannot thereafter be transferred to the "Extra Stock" Section

Entry Fees—same as corresponding Classes

* POULTRY

Judges: C. M. Crichton, W. Huntly, John Meikle, R. Stainthorpe

¹ **Champion Challenge Bowl**, value £50, for the best exhibit in the Poultry Classes.

First Premium—ONE SOVEREIGN; *Second Premium*—TEN SHILLINGS. In each Class in which there are four or more entries a Third Prize of Five Shillings may be awarded, provided there is sufficient merit in the pens. In addition to the Premiums, the Judges may award *one* Very Highly Commended, *one* Highly Commended, and as many Commended tickets in each class as they consider justified by the number and merit of the entries.

Champion Medals are offered as follows:—

- | | |
|---|---|
| 1. Best Cock, any Variety.
2. Best Hen, any Variety.
3. Best Cockerel, any Variety. | 4. Best Pullet, any Variety.
5. Best Waterfowl.
6. Best Turkey. |
|---|---|

Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.

Entry Fees—Members, 2s. 6d. Non-Members, 4s.

LEGHORN—	Class	WYANDOTTE—continued	Class
<i>White</i>	1. Cock	<i>Gold or Silver</i>	37. Cockerel
	2. Hen		38. Pullet
	3. Cockerel	<i>White</i>	39. Cock
	4. Pullet		40. Hen
<i>Any other Colour</i>	5. Cock		41. Cockerel
	6. Hen		42. Pullet
	7. Cockerel	<i>Partridge</i>	43. { Cock or
	8. Pullet		43. { Cockerel
MINORCA	9. Cock		44. { Hen or
	10. Hen		44. { Pullet
	11. Cockerel	<i>Any other Colour</i>	45. { Cock or
	12. Pullet		45. { Cockerel
SCOTCH GREY	13. Cock		46. { Hen or
	14. Hen		46. { Pullet
	15. Cockerel	RHODE ISLAND RED	47. Cock
	16. Pullet		48. Hen
PLYMOUTH ROCK—			49. Cockerel
<i>Barred</i>	17. Cock		50. Pullet
	18. Hen	SUSSEX—	
	19. Cockerel	<i>Light</i>	51. Cock
	20. Pullet		52. Hen
<i>Any other Colour</i>	21. { Cock or		53. Cockerel
	21. { Cockerel		54. Pullet
	22. { Hen or	<i>Any other Variety</i>	55. Cock
	22. { Pullet		56. Hen
ORPINGTON—			57. Cockerel
<i>Black</i>	23. Cock		58. Pullet
	24. Hen	DORRING—	
	25. Cockerel	<i>Coloured</i>	59. Cock
	26. Pullet		60. Hen
<i>Buff</i>	27. Cock		61. Cockerel
	28. Hen		62. Pullet
	29. Cockerel	<i>Silver Grey</i>	63. Cock
	30. Pullet		64. Hen
<i>White</i>	31. Cock		65. Cockerel
	32. Hen		66. Pullet
	33. Cockerel	SCOTS DUMFRY	67. Cock
	34. Pullet		68. Hen
WYANDOTTE—			69. Cockerel
<i>Gold or Silver</i>	35. Cock		70. Pullet
	36. Hen		

¹ Given by the Proprietors of 'The Scottish Poultry News,' Aberdeen. The Bowl will become the property of the exhibitor who shall win it three times, not necessarily in succession. A Silver Medal will be awarded to the winner each year.

Special Entry Forms for Poultry Classes.

* See Regulations 66 and 67.

	Class	DUCKS—continued	Class	
INDIAN GAME	71. Cock	<i>Orpington</i>	95. Drake	
	72. Hen		96. Duck	
	73. Cockerel		97. { Drake	
	74. Pullet		{ (young)	
OLD ENGLISH GAME	75. Cock	<i>Indian Runner</i>	98. { Duck	
	76. Hen		{ (young)	
	77. Cockerel		99. Drake	
	78. Pullet		100. Duck	
BANTAM— <i>Game</i>	79. Cock	<i>Any other Variety</i>	101. Drake	
	80. Hen		102. Duck	
	<i>Other than Game</i>		81. Cock	103. Gander
			82. Hen	104. Goose
<i>Any Variety</i>	83. Cockerel	TURKEYS	105. Cock	
	84. Pullet		106. Hen	
Any other recognised Breed		TABLE POULTRY—		
		(a) TABLE FOWLS—		
		<i>Any pure Breed</i>		
		107. {	Pair of	
		{	Cockerels	
		108. {	Pair of	
		{	Pullets	
		<i>Game-Cross</i>	109. {	Pair of
			{	Cockerels
		110. {	Pair of	
		{	Pullets	
		<i>Any other Cross</i>	111. {	Pair of
			{	Cockerels
		112. {	Pair of	
		{	Pullets	
CROSS-BRED FOWLS FOR LAY- ING PURPOSES		(b) DUCKLINGS FOR TABLE		
		PURPOSES—		
		<i>Any Breed or Cross</i>		
		113. {	Pair of	
		{	Ducklings	
DUCKS— <i>Aylesbury</i>				
		91. Drake		
		92. Duck		
		93. { Drake		
		{ (young)		
		94. { Duck		
		{ (young)		

AMOUNT OF POULTRY PREMIUMS, £197, 15s

Special Entry Forms for Poultry Classes.

* FUR-PRODUCING RABBITS

First Premium—FIFTEEN SHILLINGS; Second Premium—TEN SHILLINGS; Third Premium—FIVE SHILLINGS. In each Class in which there are less than four entries the Third Prize of Five Shillings will not be awarded. In addition to the Premiums, the Judges may award *one* Very Highly Commended, *one* Highly Commended, and as many Commended tickets in each Class as they consider justified by the number and merit of the entries.

Class.

1. Blue Beveren, Buck.
2. Blue Beveren, Doe.
3. Blue Beveren, Buck or Doe, under 5 months at first day of Show.
4. Chinchilla, Buck.
5. Chinchilla, Doe.

Class.

6. Chinchilla, Buck or Doe, under 5 months at first day of Show.
7. Havana, Buck or Doe.
8. Lilac, Buck or Doe.
9. Angora, Buck or Doe.
10. Any other variety of Fur-producing Rabbit, Buck or Doe.

Entry Fee—2s. 6d. each rabbit.

PRIZE MONEY BY SOCIETY £7, 10s.

CONTRIBUTED BY THE SCOTTISH FUR BREEDERS' ASSOCIATION, LTD. £7, 10s.

Special Entry Forms for Rabbit Classes.

* See Regulations 66 and 67.

HONEY, &c.

Judge: L. M'D. Thake

OPEN CLASSES

Class.	Entry Fees—2s. 6d. each.	Premiums.		
		1st.	2nd.	3rd.
1. Six Sections of Comb Honey, excluding Heather Honey		20/-	15/-	10/-
2. Six Sections of Heather Honey		20/-	15/-	10/-
3. Six Jars of Run or Extracted Light-coloured Honey, approximate weight 6 lb.		20/-	15/-	10/-
4. Six Jars of Run or Extracted Medium or Dark-coloured Honey, excluding Heather Honey, approximate weight 6 lb.		20/-	15/-	10/-
5. Six Jars of pressed Heather Honey in liquid form, approximate weight 6 lb.		20/-	15/-	10/-
6. Six Jars of Granulated Honey, approximate weight 6 lb.		20/-	15/-	10/-
7. Two shallow Frames of Comb Honey for extracting purposes		20/-	15/-	10/-
8. Products made with the aid of Honey. (Recipe to be attached, which will be treated as confidential)		20/-	15/-	10/-
9. Best display of Honey in any form staged in space 3 feet by 3 feet, height from table not exceeding 4 feet. Weight of honey not to exceed 100 lb.		60/-	30/-	20/-
10. Best display of Honey in any form staged in space 3 feet by 3 feet, height from table not exceeding 4 feet. Weight of honey not to exceed 40 lb.		60/-	30/-	20/-
11. Best exhibit of not less than 1 lb. of Wax in any form		20/-	15/-	10/-
12. Best exhibit of not less than 1 lb. of Wax made into shapes for retail trade and over-counter trade. Convenience in packing to be taken into consideration		20/-	15/-	10/-
13. Observatory Hive with Queen and Bees		50/-	30/-	15/-

(Confined to Scottish Exhibitors.)

14. One shallow Frame of Comb Honey for extracting purposes	20/-	15/-	10/-
15. Six Sections of Comb Honey, excluding Heather Honey	20/-	15/-	10/-
16. Six Sections of Heather Honey	30/-	20/-	10/-
17. Six Jars of Run or Extracted Medium or Dark-coloured Honey, excluding Heather Honey, approximate weight 6 lb.	30/-	20/-	10/-
18. Six Jars of Run or Extracted Light-coloured Honey, approximate weight 6 lb.	30/-	20/-	10/-

The Silver and Bronze Medals will be awarded by the Scottish Bee-Keepers' Association to the First and Second winners of the greatest number of points in Honey Classes calculated on the following basis: 1st prize, 3 points; 2nd prize, 2 points; 3rd prize, 1 point.

PRIZE MONEY BY SOCIETY £41, 5s. 0d.

CONTRIBUTED BY SCOTTISH BEE-KEEPERS' ASSOCIATION £10, 10s. 0d.

Special Entry Forms for Appliances and Honey.

Should there be in any class three or less than three entries, the value of the first prize will be reduced to that of the second, the second to that of the third, and no third prize will be awarded.

RULES AND REGULATIONS.

1. All exhibits must be despatched in time to be delivered at the Showyard not later than 6 P.M. on Monday, 13th July. According to railway regulations, exhibitors will require to pay return carriage when despatching. Return carriage-paid labels will be supplied by the

Secretary, and must be addressed for the return journey, and have numbers of Classes on same. Non-compliance with this regulation will mean that the exhibit will be left in the Showyard. Boxes containing jars or sections must be *secured* and not nailed, and the bottles and sections so placed that they can be lifted out and replaced without disturbing the packing.

2. The number of the exhibit will be sent by the Secretary (as entered on the card), and must be placed on every exhibit and on each detachable part of exhibit—viz., on every jar of Extracted Honey. The number must be gummed on the side of the jar at the foot and not on the bottom or cap. No goods will be allowed to be staged unless this rule is complied with.

3. No card, trade mark, or name of the exhibitor may be placed upon any part of an exhibit. Every article exhibited must be the property of the exhibitor, and all honey must have been gathered in the natural way within Great Britain, Northern Ireland, and Irish Free State, by bees the property of the exhibitor.

4. Comb Honey must be glazed on both sides, to protect the honey from injury. If paper edging is used, it must be of such a width as to leave $3\frac{1}{2}$ inches by $3\frac{1}{2}$ inches of glass clear of the lace paper, or in any other neat way capable of easy removal by the Judges, in small boxes glazed on both sides, such as supplied by dealers.

5. All Run, Extracted, and Granulated Honey must be shown in the usual mercantile Glass Jars holding approximately 1 lb., except in Classes 9 and 10.

6. No exhibitor shall be allowed to take more than one prize in any one class.

7. The Judge shall be empowered to withhold prizes in case of insufficient merit.

8. Should there be in any class three or less than three entries, the value of the first prize will be reduced to that of the second, the second to that of the third, and no third prize will be awarded.

9. The Judge will commence his inspection at 10.30 a.m. on Tuesday, and the Bee Shed will be closed to the public during the judging.

10. Exhibits of Honey may be placed in their positions in the shed before the opening and removed at the close of the Show by exhibitors themselves or their representatives. In the event of neither the exhibitor nor a person with written authority from the exhibitor being present to place or remove the exhibits, they will be placed and removed by men hired and paid by the Society, but this will be done on the understanding that the men are hired to do the work on behalf of the exhibitors, and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. In the case of exhibits which are not removed by 5.30 p.m. on the closing day of the Show, the Society will hold itself at liberty to hand them over to the railway companies for despatch to the respective exhibitors.

11. No lot can be removed from the yard till 5 p.m. on Friday, the last day of the Show.

12. The Society undertakes no responsibility for the receipt or despatch of exhibits, nor for any injury exhibits may sustain during the Show or otherwise.

13. **Railway delivery charges from station to Showyard and back to be paid by exhibitor. See pp. 81 and 82.**

* DAIRY PRODUCE

Judge: William M'Fadzean

No Exhibitor to show more than one lot in any Class

Entry Fees—Members, 5s.; Non-Members, 7s. 6d.

Class		Premiums.			
		1st.	2nd.	3rd.	
		£	£	£	
1.	Powdered Butter, not less than 8 lb.	4	2	1	
2.	Fresh Butter, three 1-lb. rolls	4	2	1	
3.	Cheddar Cheese, 56 lb. and upwards—£6, £4, £2, £1				£14
4.	Sweet-Milk Cheese, flat shape, white in colour, from a dairy where all cheese is made according to the Dunlop method—£4, £2, £1				18
5.	Cheese, 14 lb. and under—£3, £2, £1				7
					6
					£40

Special Entry Forms for Dairy Produce.

* See Regulations 75 and 76.

Railway delivery charges from station to Showyard and back to be paid by exhibitor. See pp. 81 and 82.

WOOL

Judge : Alexander Reid

THREE Fleeces in each Entry and must be shown entire. Entry Fee, 5s.

PURE BREED CLASSES

PURE-BRED CATTLE.							Premiums.		
Class							1st.	2nd.	3rd.
*BLACKFACE.							£	£	£
1. Ewe .	.	.	.	.	.	.	3	2	1
2. Wether .	.	.	.	.	.	.	3	2	1
3. Hogg .	.	.	.	.	.	.	3	2	1
CHEVIOT.									
4. Ewe .	.	.	.	.	.	.	3	2	1
5. Hogg .	.	.	.	.	.	.	3	2	1
BORDER LEICESTER.									
6. Ewe .	.	.	.	.	.	.	3	2	1
7. Hogg .	.	.	.	.	.	.	3	2	1
HALF-BRED.									
8. Ewe .	.	.	.	.	.	.	3	2	1
9. Hogg .	.	.	.	.	.	.	3	2	1
†SHETLAND.									
10. Ewe .	.	.	.	.	.	.	3	2	1
11. Hogg .	.	.	.	.	.	.	3	2	1
TOTAL PRIZE MONEY FOR WOOL, £66.							£66		

Cheviot, Border Leicester, and Half-Bred Fleeces must be shown washed, and Blackface and Shetland Fleeces unwashed. All Fleeces must be shorn in the year of the Show from sheep bred and reared on, or regular stock of, the exhibitor's farm.

Railway delivery charges to and from Showyard must be paid by the exhibitor.

Special Entry Forms for Wool Classes.

* Blackface Ewe Fleeces shall be not less than 4½ lb., and Wedder and Hogg Fleeces not less than 6 lb. in weight.

† An exhibit of Shetland Wool may comprise fleeces of one or more colours, but each fleece must be self-coloured.

Railway delivery charges from station to Showyard and back to be paid by exhibitor. See pp. 81 and 82.

RURAL INDUSTRIES

Entry Fees, 2s. 6d. each article.

OPEN CLASSES.

Class.	SHETLAND KNITTING.	Premiums.		
		1st.	2nd.	3rd.
1. Fine Lace Goods (separate entry for each article)	.	£3	£2	£1
2. Jumper, Sports Coat, or Dress—one or more colours	.	3	2	1
3. Jumper or Sports Coat—all over Fair Isle	.	3	2	1
4. Other Exhibits (separate entry for each article).	.	2	1	10/-

TWEEDS.

5. Harris or other Tweed—Hand-spun, Hand-woven, and Vegetable-dyed	.	3	2	1
6. Tweed—Mill-spun, Hand-woven	.	3	2	1

MISCELLANEOUS.

7. Home-made Rug (wool)	.	3	2	1
8. Embroidery—white	.	3	2	1
9. " coloured	.	3	2	1
10. Leather Gloves	.	2	1	10/-
11. Specimen of Leather Work other than Gloves	.	2	1	10/-
12. " Furcraft	.	2	1	10/-
13. " Hand-painted Pottery	.	2	1	10/-
14. " Basket Work (Hafia not eligible)	.	2	1	10/-
15. Bottled Fruit and Vegetables (three bottles, bottled in or before 1924)	.	2	1	10/-
16. Best collection of Vegetable-dyed Wools	.	2	1	10/-
17. Home-spun Yarn—2-3 cuts	.	2	1	10/-
<hr/>				
				£79 10

CONFINED CLASSES.

Open to Institutes and Members of Institutes in the whole of Scotland.

		Premiums.		
		1st.	2nd.	3rd.
18. Lace of all kinds, other than Crochet	.	£3	£2	£1
19. Knitted Jumper or Jersey (other than Fair Isle)	.	3	2	1
<hr/>				£12 0

Confined to Institutes and Members of Institutes in the South-Western Area of Scottish Women's Rural Institutes.

		Premiums.		
		1st.	2nd.	3rd.
20. Rug—made from old material	.	£2	£1	10/-
21. Embroidery—woollen	.	2	1	10/-
22. Stockings (men's or women's), 5-ply fingering	.	2	1	10/-
23. Home-cured Ham	.	2	1	10/-
24. (<i>No Entry Fee</i>).—Special Prizes to the Institute winning the largest number of prizes in Classes 20, 21, 22, and 23. First prize to count six points, Second Prize five points, Third Prize four points, V.H.C. three points, H.C. two points, and C. one point	.	3	2	1
<hr/>				£20 0

PRIZE MONEY BY SOCIETY £79 10

CONTRIBUTED BY THE CENTRAL COUNCIL OF SCOTTISH WOMEN'S
RURAL INSTITUTES FOR THE CONFINED CLASSES . . . £32 0

NOTE.—No exhibit may be entered in more than one Class.

RURAL INDUSTRIES—continued.**REGULATIONS.**

1. The Competition, except where otherwise stated, is open to competitors from all parts of Great Britain, Northern Ireland, and Irish Free State. Societies or Institutes, as well as individuals, shall be allowed to compete. An exhibit which has won a prize at a Show of this Society shall not be eligible for entry at a future Show.

2. Every exhibit must be the work either of the Exhibitor or of a member of the exhibiting Society or Institute.

3. An entry fee of 2s. 6d. for each exhibit is payable at the time of entry.

4. Exhibits will be received in the Showyard not later than 8 P.M. on Monday, the day before the opening of the Show. Judging will commence at 9.30. A.M. on Tuesday. The section will be closed to the public during the judging. Exhibits shall not be removed till after the close of the Show.

5. Exhibits shall be entirely at the risk of exhibitors, who shall be solely responsible for delivery and removal of their own exhibits. In the event of neither the exhibitor nor a person with written authority from the exhibitor being present to place or remove exhibits, these will be placed and removed by men hired and paid by the Society; but this will be done on the understanding that the men are hired to do the work on behalf of the exhibitors and solely at their risk, and that the Society will be in no way responsible for expenses incurred or loss of or injury to exhibits by errors or accidents in placing, despatching, or conveying exhibits. A receipt signed by the exhibitor, on a form to be issued by the Secretary, must be delivered before any exhibit is handed over to the exhibitor or his or her representative.

6. Exhibitors shall be allowed to place with their exhibits a notice indicating where (in the Showyard or elsewhere) similar articles may be purchased.

7. Exhibits must not be sent to the Society's Office previous to date of Show. Labels, &c., will be posted to Exhibitors about fourteen days prior to the Show.

8. **Railway delivery charges from station to Showyard and back to be paid by exhibitor. See pp. 81 and 82.**

Special Entry Forms for Rural Industries Section.

HORSE SHOEING

Open to Shoeing-Smiths from any part of Great Britain, Northern Ireland, and Irish Free State.

Horses provided for this Competition cannot be entered in any other Class.

THURSDAY, 16TH JULY.

Class 1.—CART HORSES (Open Class).

1st Prize, £5 and Gold Watch.*	5th Prize, £3.
2nd Prize, £5 and Canteen of Cutlery.†	6th Prize, £2.
3rd Prize, £5 and Gold Medal.‡	7th Prize, £2.
4th Prize, £4 and Gold Medal.§	8th Prize, £1.

(Eight prizes will be awarded only if at least 12 Competitors take part.)

FRIDAY, 17TH JULY.

Class 2.—CART HORSES (Juniors under Twenty-three Years of Age).

1st Prize, £5 and Clock.**	4th Prize, £1 and Gold Medal.§
2nd Prize, £3 and Canteen of Cutlery.†	5th Prize, £1.
3rd Prize, £2 and Gold Medal.‡	

* Gold Watch given by Messrs William Martin, Sons, & Co., to the winner of First Prize in Class 1.

** Clock given by the Scottish Iron and Steel Co., Ltd., to the winner of the First Prize in Class 2.

† Canteen of Cutlery given by Messrs Neilson & Cleland, Coatbridge, to the winner of Second Prize in each Class.

‡ Gold Medal given by the Mustad Nail Company to the winner of Third Prize in each Class.

§ Gold Medal given by Capewell Nail Company to the winner of the Fourth Prize in each Class.

PRIZE MONEY BY SOCIETY	£23
CLOCK AND £10 BY THE SCOTTISH IRON & STEEL CO., LTD., GLASGOW	£15
GOLD WATCH AND £5 BY MESSRS WILLIAM MARTIN, SONS, & CO., COATBRIDGE	£10
CUTLERY BY MESSRS NEILSON & CLELAND, LTD., COATBRIDGE	£8
GOLD MEDALS BY MUSTAD NAIL CO.	£4
GOLD MEDALS BY CAPEWELL NAIL CO.	£4

1. Entries must be made with the Secretary not later than 21st May. Entry Fee, 2s. 6d. for each Class. Entry Forms may be had on application.

2. The Competition will take place in the Showyard, and will be decided by points, time being taken into consideration. Each Competitor must make and fix one fore and one hind shoe, having previously taken off the old shoes. The shoes must be fullered, with low calkins, and with toe-pieces fore and hind. The use of files and wire brushes is not permitted. Each Competitor must bring his own tools, nails, and a striker. The striker will not be allowed to touch the horse's hoof. The local Blacksmiths' and Farriers' Association will provide forges and anvils. The horses to be shod will be provided by the Association. Forges and horses will be balloted for.

3. Any Competitor who does not attend at the Horse-Shoeing Stance, and answer to his name at 9.30 a.m. on the day on which he is entered for competition, will be debarred from competing.

4. The Competitor and his striker will be admitted to the Yard free of charge on the day of Competition on presentation of tickets which will be sent to the Competitor for the purpose.

The Dundyvan horse-shoe iron to be used in the Open Class, and the Waverley horse-shoe iron to be used in the Junior Class, will be supplied by Messrs Neilson & Cleland, Ltd., Coatbridge, who will also provide the necessary smithy coal.

Special Entry Forms for Horse-Shoeing Classes.

ABSTRACT OF PREMIUMS.

(Champion Medals given by the LORD BLYTHSWOOD, K.C.V.O.)

GIVEN BY THE SOCIETY.

Cattle	£1172	0	0
Horses	953	0	0
Jumping Competitions	175	0	0
	507	0	0
Goats	36	0	0
Pigs	287	0	0
Poultry	197	15	0
Fur-Producing Rabbits	7	10	0
Bee Appliances and Honey	41	5	0
Dairy Produce	40	0	0
Wool	66	0	0
Rural Industries	79	10	0
Horse Shoeing	23	0	0
Medals to Breeders, &c.	20	0	0
Prizes for Timber ¹	40	0	0
	£3645	0	0

CONTRIBUTED PRIZES, CUPS, &c.

The Lord Blythswood, K.C.V.O.—Champion Medals	36	0	0
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CATTLE.

Tweeddale Gold Medal	£25	0	0
*The late Mr William Duthie, Collynie, Tarves	150	0	0
*Mr Emilio R. Casares, jun., London	50	0	0
The Shorthorn Society, and 2 Medals	40	0	0
Scottish Central Shorthorn Breeders' Association	20	0	0
*The late Sir George Macpherson Grant, Bart.	50	0	0
*The late Sir John Macpherson Grant, Bart.	50	0	0
Aberdeen-Angus Cattle Society	10	0	0
*Galloway Cattle Society	50	0	0
The Dun and Belted Galloway Cattle-Breeders' Association	35	0	0
*Renfrewshire Perpetual Gold Challenge Cup	250	0	0
*Highland Cattle Society of Scotland	89	5	0
Shorthorn Society, and 2 Medals (Dairy Shorthorns)	20	0	0
Dairy Shorthorn Association	15	0	0
*Fife and Kinross Perpetual Gold Challenge Cup	200	0	0
*Cowhill Champion Cup	30	0	0
Ayrshire Cattle Herd-Book Society	20	0	0
British Friesian Cattle Society	64	0	0
*MacRobert Bell	52	10	0
*Kinmount Challenge Cup	50	0	0
Red Poll Cattle Society	30	0	0
*Mrs Brown, Knockbrenx	50	0	0
	1350	15	0

HORSES.

*Paisley Perpetual Gold Challenge Cup	£300	0	0
*Cawdor Challenge Cup	52	10	0
"William Taylor" Memorial Committee	10	0	0
Hunters' Improvement and National Light Horse Breeding Society	10	0	0
Contributed by persons interested in Hunters	50	0	0
Board of Agriculture for Scotland	40	0	0
National Pony Society	10	0	0
The Highland Pony Society	10	0	0
A past President of the Shetland Pony Stud-Book Society	10	0	0
"Five Lovers of Breed" (Shetland Ponies)	10	0	0
Shetland Pony Stud-Book Society (Medal)			
*Glasgow Challenge Cup	50	0	0
Contributed by persons interested in Harness Horses	100	0	0
	652	10	0

Carry forward

£5684 5 0

¹ Grant to Royal Scottish Arboricultural Society for Prizes for Timber.

* Challenge Prizes.

ABSTRACT OF PREMIUMS—*continued*

Brought forward			£5684	5	0
SHEEP.					
*Cheviot Sheep Society—Borthwick Challenge Cup		£25	0	0	
Society of Border Leicester Sheep-Breeders		20	0	0	
*Challenge Cup for Oxford-Down Sheep		50	0	0	
Oxford-Down Sheep-Breeders' Association		21	0	0	
Suffolk Sheep Society		25	0	0	
Mr Dugald M'Kechnie, Glasgow		10	10	0	
Earl of Elgin and Kincardine, C.M.G.		10	0	0	
Dorset Horn Sheep-Breeders' Association		5	0	0	
			166	10	0
GOATS.					
Board of Agriculture for Scotland		£12	0	0	
*Lord Dewar		21	0	0	
*Mrs S. Macdonald, Garrochty		10	0	0	
			48	0	0
PIGS.					
National Pig-Breeders Association		£26	0	0	
*Large Black Pig Society (Champion Cup £10, 10s., Cash £25)		35	10	0	
Cumberland Pig-Breeders' Association		20	0	0	
Large White Ulster Pig Society		20	0	0	
			101	10	0
POULTRY.					
*Proprietors of 'The Scottish Poultry News,' Aberdeen			50	0	0
FUR-PRODUCING RABBITS.					
Scottish Fur Breeders' Association, Ltd.			7	10	0
HONEY.					
The Scottish Bee-Keepers' Association			10	10	0
RURAL INDUSTRIES.					
Central Council of Scottish Women's Rural Institutes			32	0	0
HORSE SHOEING.					
The Scottish Iron & Steel Co., Ltd., Glasgow (Clock and £10)		£15	0	0	
Messrs Neilson & Cleland, Limited, Coatbridge (Cutlery)		8	0	0	
Messrs W. Martin, Sons & Co., Coatbridge (Gold Watch and £5)		10	0	0	
Mustad Nail Co. (2 Gold Medals)		4	0	0	
Capewell Nail Co. (2 Gold Medals)		4	0	0	
			41	0	0
			£6136	5	0
* Challenge Prizes.					

JOHN STIRTON, *Secretary.*3 GEORGE IV. BRIDGE,
EDINBURGH, *March 1925.*

SILVER MEDALS FOR NEW OR IMPROVED IMPLEMENTS.

See Regulations on page 78.

FORESTRY EXHIBITION.

For information as to above, apply to the Secretary, Royal Scottish Arboricultural Society, 8 Rutland Square, Edinburgh.

WOOL DEMONSTRATIONS.

Arrangements are being made for Demonstrations on Wool, to be held in the Wool Shed on Wednesday, Thursday, and Friday, 15th, 16th, and 17th July.

**The Society's Show for 1926 will be held
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JOHN STIRTON, Secretary.

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3 GEORGE IV. BRIDGE, EDINBURGH.**

